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ADDRESSES AND ORIGINAL ARTICLES

NEURASTHENIA: TOXIC AND TRAUMATIC*

BY H. V. DICKS, M.D. CAMB., M.R.C.P. LOND.
PHYSICIAN TO THE INSTITUTE OF MEDICAL PSYCHOLOGY, LONDON

NEURASTHENIA, as a clinical entity, is elusive. Everywhere we meet with the statements that it is rare, that it is but infrequently seen in pure form, that it is only with difficulty distinguishable from other disorders, and so on. Yet no name is more often upon the lips of both our profession and the laity when speaking of functional disorders, and with its cousins "nervous debility" and "nervous exhaustion" it accounts for a considerable proportion of health insurance claims. The word serves its most useful purpose perhaps as a vague generic term for almost any form of psychological disorder other than frank insanity; it appeases the layman's thirst for a label without shocking a false self-esteem; and fortunately the approved societies are not yet so advanced in psychopathology as to quarrel with it. Matters become more serious when, with its implication of a definite pathology, it satisfies the physician that he has arrived at the full diagnosis. Hence I submit that the concept has outlived its usefulness; that the symptoms described under the heading of neurasthenia can for the most part be related to other disorders; and that what remains —namely, states of true exhaustion as the results of the action of toxins, including those of fear and of fatigue—should be called by some name that does not commit us to an obsolete theory, and should be regarded as syndromes or sequelæ of underlying conditions. This view is held, among many others, by Sir Farquhar Buzzard [1] and Prof. Millais Culpin.[2 3]

The position is strictly analogous to the concept of "rheumatism"—at one time the diagnostic rubbish-heap of a group of pathologically distinct conditions having a few symptoms in common—which is being gradually sifted and clarified into separate morbid processes. I hope to show that this position is no mere nominalist quarrel but is designed to promote understanding and to clear away sterile hypotheses, which are prevalent where psychopathological states are concerned.

We owe the concept of neurasthenia to Beard,[4] who in the 'seventies of last century began publishing accurate observations on the physical and mental symptoms of the neurotic. In thus drawing attention to a completely neglected field and emphasising the economic as well as the clinical importance of these subjective disorders, he deserved well of his generation. In coining the term neurasthenia, however, he launched a theory of pseudo-science for which we have paid dearly. About his time some of the physiological properties of nerve irritability had been experimentally demonstrated. Our knowledge of these experimentally ascertained facts even to-day is certainly not one which would encourage us to form very definite hypotheses of disease processes on their basis. They amount to the statements that (*a*) there is no fatigue in nerve trunks, and (*b*) that in intact animals "the break in the neuromuscular chain which is the expression of fatigue occurs . . . in the central nervous system and is probably due to some reflex inhibition." [5] The only types of physiological fatigue in the central nervous system described are those of repeated monotonous stimulation and those due to the direct action of experimentally administered toxic substances. Yet on grounds even scantier than these Beard built a hypothesis to account for the varied and heterogeneous symptoms that constitute the clinical picture of the various psychoneuroses, which to him presented but one continuous blurred whole. There is no need to state his theory in detail. For him neurasthenia is nervous —shall we say, neuronic—exhaustion, caused by an excess of waste over repair in actual neural tissues, resulting in instability of function and reflex irritation of all parts of the central nervous system, and thus producing the clinical state described by him, which to psychopathologists of to-day comprises all the minor psychoses including many hysterical symptoms, although hysteria existed as a separate concept in Beard's mind. Even the various phobias are accounted for by this theory, and notably "siderodromophobia" or fear of railways, for which I feel sure he postulated a separate cortical centre! The hypothesis, therefore, is purely one of nutrition—energy and its disturbances. The chief factor of blame is "civilisation" with its "wear" on the nerve-cells, and "indulgence of passions and appetites" and the "nervous diathesis" as secondary factors. This is the real connotation of the term neurasthenia, and one wonders whether this is the pathology conjured up in the minds of those who so frequently diagnose the complaint.

It cannot be denied that this purely material, neurological approach to psychopathology has had a paralysing effect upon medicine in general, because so long as we followed it we remained entirely outside the world of the patient's mind, moving on a plane which has no understanding of his personality as a whole and content with the vague, though doubtlessly true, postulate that somehow mind must be related to an activity in the central nervous system —with sedatives and sea voyages as our only therapeutic weapons. Indeed, one of Beard's own quotations vividly comes to mind. Speaking of the contempt for and neglect of the subject of neurasthenia on the part of the great physicians of his day he says ". . . so now imaginations of the patient were vaguely relegated to 'hypochondria,' a term which, in this generation, covers all the symptoms which the physician either doubts or misinterprets." If for "hypochondria" we read "neurasthenia" the position to-day is practically unchanged, save that the new element of focal sepsis has been introduced under the guise of "toxic neurasthenia." I cannot here dwell on the causes of this fear or lack of interest on the part of the majority of doctors in any matters affecting their patients' minds, but it is clear that medical education has as yet done nothing to correct and is doing much to perpetuate this attitude.

A TYPICAL CASE

My own faith in the myth of "nervous exhaustion" as the cause of functional disorder was shattered finally by the following case, which conformed to the classical features of so-called traumatic neurasthenia, and had the additional advantage of a suspected toxic factor. It is typical of numberless cases seen daily in general and hospital practice.

An electrician, aged 46, was admitted for out-patient treatment at the Institute of Medical Psychology complaining of very severe lack of energy, a high and easily

* Summary of a lecture delivered at the Institute of Medical Psychology.

induced sense of fatigue after the least exertion, aches and pains in various parts of his body, pressure sensations over one side of his head, mild indefinite dyspepsia, creepy feelings down his spine, lack of concentration, moodiness, irritability, and insomnia, to mention only the most prominent of his symptoms. He was a valetudinarian, careful with diet, abstinent from every form of alcohol and alkaloid, and lately even of marital intercourse "in case it weakened him." This condition had come on some months before and was so severe as to necessitate sick leave, and was ushered in by a "fainting attack" while at work. There was a past history of three previous attacks, the first one at the age of 36 when the patient was, in the course of duty, hit over the head by the falling branch of a tree, and had several teeth smashed. In each case there were long periods, up to six months, of sick leave. On the physical side the patient was a stocky, well-preserved man who showed no abnormality except somewhat enlarged tonsils, some pallor of the face, a very unstable systolic blood pressure: on the first examination it was 145, after a few interviews at rest it was 105, diastolic 65—i.e., rather low. The urine was normal, the blood picture showed 4,800,000 red cells, hæmoglobin 80 per cent., and 8000 white cells with a normal differential count. The patient had had several attacks of severe tonsillitis in his younger days. He attributed his troubles to overwork and conscientiousness. He was now threatened with compulsory retirement. His own doctor was at a loss as to the treatment, but realised the nature of the condition.

Doubtless, it will be said, a case of "toxic neurasthenia" due to tonsillar sepsis and overwork—"nervous exhaustion" in fact. There were, however, certain factors in the history and clinical picture which suggested a different story.

As an experiment the tonsils were, for the moment, left alone, and psychotherapy in the form of a modified analysis was tried. A long and somewhat complex story emerged at the next few interviews, which amounted to this:—

Patient had been very ambitious and successful, and was pleased with himself to the point of conceit. On each occasion when he developed an attack of "neurasthenia" he had been in emotional difficulties, chiefly through conflict with his superiors. The first attack—where he was hit by the branch—was not associated with any notable physical injury, yet the headache he had since had was always just over the site of the original blow. It also emerged that patient as a child had been extremely backward and had been regarded as the disgrace and idiot of a large working-class family. The present attack had occurred as the result of a severe and apparently unjust reprimand by a superior officer, following upon a day of minor domestic misfortunes. The patient had left his office in a condition of intense excitement. At this point of the narrative he came to a complete break in his conscious recollection, and only remembered being delivered at his front door—some ten miles away—by a friendly lorry driver.

In order to break through this amnesia covering some hours, hypnosis was resorted to. As soon as this was achieved the patient broke into violent weeping, convulsed with emotion, exclaiming "Mummy, mummy!" He was allowed to express these feelings freely, was then made to recollect the events of the amnesic period which amounted to his sitting weeping by the roadside in an agony of thwarted rage and self-pity, and being at last picked up by the friend who happened to pass. He was finally told to remember all this when he awoke.

Two days later he was next seen, when he reported that all his symptoms had completely disappeared and that he felt quite strong. He resumed work in his garden almost immediately, was able to go for 5 and 10 mile walks, and returned to duty within a fortnight. Analytical treatment was continued and, briefly, revealed the following development:—

As a backward child he was made the family scapegoat and had vivid memories of severe and brutal punishments by his drunken father, which drove him at first to his mother's side for protection. Later on he felt ashamed of being a "mother's boy" and overcompensated for his feelings of weakness by an assertion of independence and the determination to "outdo them all," which, in point of fact, he achieved at the cost of repression of the earlier fearful "mother's boy" in him, which was thus entirely banished from his idea of self. Subsequently, as usually occurs, all men in authority became to him symbols of his father, and his reaction to them was a priori one of resentment and defence. A situation in which they criticised or blamed him was intolerable and was the signal for the mobilisation of the old conditioned response of fear. Being intolerable to the patient's conscious self, this defended itself by repression and—in the amnesia of the "fainting attack"—by dissociation against the experience of the dreaded emotion. The trauma of the falling branch was conditioned by an early experience of some falling stones in which he narrowly missed being killed, the memory of which was also recovered after the general repression had been lifted by the hypnosis. The significance of this story burst in upon the patient's mind quite spontaneously, and the doctor's part was that of passive listener.

The symptoms were thus, one and all, explicable in terms of repressed fear or anxiety which, when released therapeutically, ceased to operate. The further purpose of the symptoms was to serve as an outlet both to his wish for sympathy (from the mother) and to his self-phantasy, which was saying "Look what a martyr to conscientiousness and duty I am, and how little my bosses (i.e., my rotten father) know what I am suffering through it." It effectively removed him from their persecution without loss of amour-propre, and he was able to indulge in the thought that it was all their fault. (These inferences are all derived from case material related by the patient.) He has remained well, on full work, as shown by follow-up, for the last six years.

DISCUSSION

There is only one factor absent from this case to complete the classical picture of so-called traumatic neurasthenia, and that is the question of claiming compensation for damages. In this man that wish appeared to be satisfied by the feeling that his employers were responsible for his condition, and also by the fact that he was, after all, having a holiday on full pay plus sickness benefit.

It is noteworthy that the condition first appeared after his accident when, so far as physical injury went, he only sustained a bruise and some scratches on his head; also, that the psychological mechanism of symptom formation is the same as that of hysteria, whether of the conversion type or of the anxiety type, a point on which again those taking part in the discussion on the subject at the Royal Society of Medicine in 1927 [1] agreed. The psychopathology and treatment of anxiety states as such is not the concern of this paper, and my aim is merely to demonstrate that in the so-called traumatic neuroses (or neurasthenia) the same psychological factors are at work.

Concerning the psychopathological factors, Sir Farquhar Buzzard says:—

> "The nature of the accident may be influential if it is such as to evoke an emotional disturbance in the form of fear. Unfortunately this 'fright' is not referred to under its proper name; it is referred to as 'shock' or a 'shock to the system,' terms which carry no discredit to the patient and which suggest indefinitely prolonged consequences."

To this statement we may add that there must be a pre-existing disposition in the nature of such a complex as was quoted a little earlier on, dating from childhood, upon which the accident acts like a trigger: the natural reaction of fear, which is what a patient thus predisposed cannot admit to consciousness, is

repressed and so led into the channels of pathological anxiety—or even of hysterical conversion into various physical disabilities ranging from pain at the site of any blow or abrasion to epileptiform seizures.

By reference to the case cited, one can also appreciate the other factors which operate in the mind of the patient (consciously or unconsciously) in traumatic neuroses: first and foremost the feeling of resentment and desire to get even, and its variant—the wish to play the hero or martyr—satisfying the self-assertive phantasy, and so easily resulting in the clamour for compensation. As the roots of this tendency may well lie in unresolved unconscious father complexes, it will be obvious that we have to regard the traumatic neurosis as a true and serious illness, in spite of the compensation factor, and from a legal point of view a company may well be held responsible to indemnify a sufferer from it because he is just as much entitled to travel, say, on a railway, as is a man with fragilitas ossium or hæmophilia, who for that reason may also run a special risk of injury.

The question of compensation in cash, however, presents only one aspect even of the so-called "litigation neurosis" which involves, as every psychoneurosis, the whole personality, and no amount of legislation will prevent the emergence of regressive, childish, egotistical urges in predisposed persons after the experience of a suitable trauma. This point is further brought home by the observation that some patients remain ill after their claims have been satisfied. This depends mainly on the strength of the infantile complexes or, as we may put it, on the degree of psychical regression. There are patients who, after a traumatic experience—especially in the war neuroses—will lapse into states of complete babyhood, trembling, weeping, inarticulate in the full sense of the term, unable to stand or walk (the so-called astasia-abasia), incontinent, and absolutely dependent on their nurses. It is these extremes that drive home the point in psychopathology, and they are occasionally met with in civilian practice. The moody, impatient, tearful, childish condition of many a neurotic depends upon this factor.

Most authors are agreed upon the importance of auto-erotic traits in the picture of so-called neurasthenia, quite apart from the traumatic types. Consciously expressed in these patients as the wish to be admired for their devotion to duty in spite of their terrible lack of energy, auto-erotism betrays itself in the unconscious desire for nursing, petting, and sympathy, and in the ever-present anxiety about and interest in their own body and its functions and sensations. It is the regression of unconscious attention (which is what we call interest) to this level, somewhat analogously to the neurological law of dissolution, which causes the withdrawal of concentrating power from the external world, and so the lack of attention and difficulty in work, diminution in sexual potency, and the feeling of being without energy. It means that psychic energy is being expended on the precious ego, that application to outer reality is a tremendous effort: hence, as Yellowlees [6] puts it, the complaint of extreme tiredness in everything but talking about their own illness. Sometimes, as Henderson and Gillespie [7] point out, a state of abnormal fatigability arises as the result of an entirely conscious conflict—perhaps a shifting of the attention to the symptom from the original trouble. This is, of course, just another variant of the working of the same unconscious tendency, and flight from the insoluble problem is accomplished by means of the illness through the psychic manœuvre of displacement at the behest of auto-erotic trends.

An interesting problem is raised by Sir F. Buzzard—viz., that in the people who receive severe physical injuries, traumatic neuroses hardly ever occur. The explanation seems to be that under these circumstances the patient will in any case be compensated both in cash and by medical and nursing attention and the sympathy of his environment, by which his egoistic needs are fully met.

THE FREUDIAN POINT OF VIEW

The Freudian school (as represented by Ferenczi [8]) have a place for the term "neurasthenia" in their classification, and denote by it what is to them a very definite pathological entity. It is a curious compromise between Beard's original view and Freud's own psychopathology of the libido. Along with the true anxiety neurosis (concerning which he states that it, also, is rarely seen in pure form) Freud classes true neurasthenia as a physioneurosis or actual neurosis, in contradistinction to the psychoneuroses, which are essentially the outcome of psychic conflict at an unconscious level.

The physioneurosis, according to him, has no psychopathology, and hence is not amenable to psychotherapy. The clinical picture he gives is the classical one of pressure symptoms in the head, spinal irritation, constipation, paræsthesiæ, loss of sexual potency, and depression, together with the cardinal symptom of abnormal fatigability. He finds the sole cause of the condition to be excessive masturbation—especially that which has continued long after puberty. This is supposed to drain away energy, just as Beard visualised it, but with this great difference, that the energy is "libido"—i.e., the psychic energy inherent in the sex instinct. Accordingly, the effect on the mind is more damaging than the actual physical loss. There is exhaustion of energy because of the total inadequacy of the external stimulus, and this inadequacy is supplemented by activity of the higher function of phantasy formation, whereas normal coitus discharges itself through lower nervous centres. The drain of sex tension is thus caused through the excessive demand upon a psychic energy investment. At the same time Freud has stressed the chemical, toxic side of this class of neurosis, which he considers to be due to intoxication by either undischarged or excessively discharged sexual substances—that is to say, an endocrine disturbance.

Like many others, I find it difficult to agree with this view, firstly because I have never seen a case resembling Freud's picture.

I have, for example, at present under my care a man of 30 who masturbates almost daily and has done so since the age of 15, a case of arrested psychological development, with a mother-fixation and various obsessional characteristics. He has at no time complained of any of the symptoms which are said to be characteristic of neurasthenia, and especially of no abnormal fatigue, and lately, with the successful analysis of his repressed aggressive, independent tendencies, he has experienced a very marked access in the feeling of general energy, concentrating power and interest in his work, in spite of the fact that he has, in respect of his sexual activities, not been much changed as yet by the treatment; he abuses himself just as much as before.

As a contrast I may mention another case, of a man of 50 with a very similar psychological state, in whom, however, the auto-erotic activity takes the form of literal narcissism, that is, the admiration of his naked image in a mirror and mild stimulation of his nipples, but owing to phobias he is especially careful to avoid seminal emission. He took several months before he could bring himself to speak of these things. This man does suffer from the neurasthenic symptom of being "whacked to the world," as well as

impotence with his wife, and would have passed as a classical case of "neurasthenia." Here there is no drain through any actual discharge, but there is a considerable drain of psychic tension into the auto-erotic activity, and further into conflicts arising from this situation, as he is a very religious and self-critical man.

Secondly, Freud's hypothesis, paradoxically enough, insists on the absence of psychic factors, but does not inquire why a person should go on masturbating and forming erotic phantasies instead of proceeding to a normal sex life long after puberty. He does mention the bad mental effects of ideas of shame and fear about the act. It would seem plain—as Stoddart,[9] one of his most devoted followers, also points out—that we are dealing here with cases of repressed auto-erotism, with varying degrees of intrapsychic conflict between that tendency and the ego-ideals of the individual, and the degree of lack of energy is the measure of drain into this wasteful conflict of psychic tension. There is, therefore, nothing in the Freudian view to disturb the psychogenic theory of abnormal fatigability which I am advocating.

TOXIC NEURASTHENIA

The last factor—i.e., exhausting illness—is perhaps the only one which so far we have not considered, and which provides the link between what I have said and so-called toxic neurasthenia, or, as I prefer to term it, toxic exhaustion states. There is truth in the observations of low blood pressure and of hyperthyroidism both in infection and in anxiety conditions resulting from long-continued emotional conflict, though hyperpiesis may equally result from the latter. The most obvious and well-established mechanism here is via the sympathetic system to the adrenal gland—the fight or flight hormone—resulting in either overactivity or ultimate failure of the adrenaline output, with all that this would imply for the brain circulation, sugar utilisation, and affection of the secretions of other endocrine glands, and the ensuing secondary excitation of the sympathetic nervous system. These changes are set out with great clarity by Cannon.[10] Between these important functional disturbances we can without much difficulty account for most of the bodily symptoms of the anxiety state.

Any infection may, under conditions which are ill understood since they are by no means constant, act in much the same way as a chronically unsolved emotional conflict—i.e., by calling upon the defence mechanism of the adrenal gland, produce the picture of a state of exhaustion. This I believe to be the long and the short of what is known of so-called toxic neurasthenia. It appears also to be the reason for the picture of "debility" resulting from any infectious disease. Where the exhaustion state continues well beyond the normal period of weakness, one becomes suspicious of added psychological factors, the original illness playing now the part of the railway accident—a peg upon which to hang the auto-erotic wishes of the personality. As a matter of clinical practice this should lead us to investigate what advantage the unconscious of the patient may be deriving from his continued state of invalidism, what unpleasant piece of reality he may be spared, or whom he may be trying to dominate or compel to solicitude in this way. The psychically healthy person who is merely overtired through genuine overwork or the effects of an infection usually recovers in a short while and his energies flow out into the world again.

DIAGNOSIS AND TREATMENT

Only the briefest reference can be made to these, in the form of a few maxims.

(1) Exclude organic disease and manic-depressive psychosis.

(2) Exclude focal sepsis by real clinical and pathological tests, rather than diagnosing toxæmia to save the trouble of a psychological approach.

(3) Settle compensation questions quickly and finally.

(4) If focal sepsis is present, deal with it.

(5) Whether focal sepsis be present or not, give adequate psychotherapy.

Even from this sketchy survey of the approach to such cases it will have been gathered that there cannot be a specific treatment of the "neurasthenic syndrome," apart from psychotherapy in general. Neurasthenia is but a label, devoid of reality, concealing individual emotional conflicts. In that these are real to the patient and account for his condition, psychopathology, when put to the therapeutic test, has the advantage over mythological neurophysiology. In due course the present views will be, in their turn, superseded by doctrines more nearly expressive of the truth.

SUMMARY

(1) "Neurasthenia" is an obsolete term, expressing an obsolete theory completely obscuring the nature of the conditions it is intended to describe, and is typical of the still prevalent lack of understanding of psychogenic illness or psychological theory.

(2) It should therefore be discarded, but if it is not, we must be clear that we are using the word as an equivalent merely of "abnormal subjective fatigability without obvious organic cause."

(3) The symptoms of the so-called "neurasthenic" state—a syndrome rather than a disease—are manifold, but reducible to the effects of long-continued unconscious fear or anxiety via the sympathetic system and its physiological connexions, if indeed they have other than a subjective existence.

(4) The neurasthenic symptoms are therefore secondary to psychopathological conflict, and on the psychic side expressive of unconscious fear, auto-erotism, and the craving for protection and sympathy in the service of the primitive urge to self-preservation.

(5) These pathogenic factors exist in the patient since early childhood, of whose modes of reaction they are "vestigial" survivals, dormant but potentially active.

(6) These reactions are capable of being unmasked by severe frights such as occur in accidents—in which case they are dignified by the name of "traumatic neurasthenia"—or by any other psychic trauma.

(7) Cases exist where infective foci have produced a clinical picture of exhaustion similar to that of the psychoneuroses, and the physiological mechanism of the symptom production is presumably the same as in purely psychogenic or mixed cases.

(8) Apart from this toxic group, the treatment is that of psychoneuroses in general, as is illustrated by the cases cited, in whom abnormal fatigue was only a very superficial expression of endopsychic conflict.

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THE PHYSIOLOGY OF INSULIN

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The word insulin, as used at present, is limited to the pancreatic hormone obtained from the islands of Langerhans of vertebrate animals, and for this reason we receive the impression that there is no other insulin in living organisms, which is not true. In plant life and in the life of all invertebrates carbohydrate metabolism takes place as perfectly as in vertebrates; glucose is oxidised and glycogen is formed by every animal cell (J. J. R. Macleod), and all this without the aid of a pancreas. It is evident then that there are cellular insulins as well as pancreatic insulin. Moreover, these cellular insulins, the evolutionary predecessors of the pancreatic insulin, still persist in vertebrates, as is shown by the fact that 60 per cent. of the carbohydrates ingested by Soskin's depancreatised dogs still metabolises after the pancreas is entirely removed.[1] Before presenting further concrete evidences of the existence of multiple insulins in animals and man, it is desirable to state in the form of a theorem my established beliefs in regard to the relation of insulin (of whatever kind) to the metabolism of carbohydrates, as developed from my clinical studies of diabetes.

THEOREM OF INSULIN

Diabetes represents a diminished state of carbohydrate metabolism which is due to a deficiency of insulin action. By introducing insulin subcutaneously this deficiency is completely overcome and the metabolism returns to normal. Therefore, the action of insulin is necessary for normal carbohydrate metabolism. Conversely, whenever carbohydrate metabolism takes place as shown by the respiratory quotient, insulin must be present; and finally, as a corollary, no carbohydrate metabolism can take place unless some kind of insulin is present. Conclusion: wherever carbohydrate metabolism occurs some kind of insulin, either pancreatic or cellular, or both, must be present.

Further evidence of the existence of multiple insulins in the body is offered by the following considerations:—

1. Metabolic data from the lives of 14 depancreatised dogs were published by Soskin.[2] From these data several general conclusions may be drawn. We will use as an example dog No. 6, which lived for 18 days after operation, or rather after withdrawal of insulin, and ate all of its food at every meal. A total of 1566 g. of carbohydrate was eaten by this dog in 17 days, and 616 g. of glucose were excreted in the urine, showing that an average of 54 g. per day (60 per cent.) was retained and utilised during this period. Such utilisation of carbohydrate could not have occurred without the assistance of insulin, and these data are direct evidence of the presence of cellular insulin after removal of the pancreas.

2. The paradox of Thalhimer also shows evidence of the presence of an insulin capable of reducing the blood-sugar to convulsive levels after all possibility of the continued action of pancreatic insulin has been excluded.

3. All animals below vertebrates lack a pancreas and yet perform all the processes of carbohydrate metabolism, including the deposition of glycogen, without the assistance of pancreatic insulin. Therefore some other form of insulin must be present.

4. Rectal injections of glucose with slow absorption, which cannot stimulate the flow of pancreatic insulin by either the neurogenic or humoral pathways, produce insulin effects which support the contention under discussion. Accurate tables of such injections prepared by Scott and Zweighaft[3] serve as a basis of argument. Two sets of cases were used. To nine medical students, after fasting 12 hours, were given 200 c.cm. of 10 per cent. glucose solution by rectum. In a later test on 50 normal individuals, 400 c.cm. of 10 per cent. glucose solution were given. The average amount of glucose recovered from the stools after four hours was 19 per cent. in both groups. This showed an actual absorption of about 80 per cent. of the sugar injected. The blood-sugar was definitely although slightly lowered, instead of raised, by this absorbed sugar. The blood-sugar level may be affected: (*a*) by sugar entering the circulation, which raises it; (*b*) by insulin entering the circulation, which lowers it. It is perfectly evident that these amounts of sugar would have raised the blood-sugar appreciably if insulin had not acted at the same time. So the conclusion should be drawn that, although absorption from the rectum occurred in goodly amount, sufficient insulin (of some kind) was brought into action to oxidise this glucose and keep the blood-sugar slightly below normal. Since pancreatic insulin could not have been stimulated through either the neurogenic or humoral pathways as now known, it must have been cellular or tissue insulin which did the work.

5. Depancreatised dogs, during the first five days after operation, present a respiratory quotient of 0·70, or thereabouts, showing that fats alone are oxidising; but, as will be shown later, insulin is necessary for the oxidation of fat as well as of carbohydrate. Therefore some extra-pancreatic insulin must be present in the dog.

6. A certain case of cancer of the liver, reported in great detail by Nadler and Wolfer,[4] offers further evidence of the existence of non-pancreatic insulin.

Attacks of hypoglycæmia lasting four and a half months gradually increased in intensity until the patient could only be kept alive by injecting 30 g. of glucose intravenously every hour. Autopsy revealed a cancerous mass occupying 70 per cent. of the liver; the pancreas, examined by Prof. Bensley, of Chicago, was normal and the tumour tissue from the liver was not islet tissue. There was no increase or decrease of islet tissue in the pancreas, nor any change in the islets themselves; the tumour tissue gave negative results as regards islet granules.

The tumour was evidently not metastatic; frequent tests of the blood were made during this whole period, and it was never found above normal levels in spite of the fact that overfeeding of carbohydrates together with the intravenous injection of large amounts of glucose were practised continually. How shall we account for this great increase of carbohydrate metabolism? The ingested carbohydrate together with the glucose of the injections entered the blood. Meanwhile, the growing cancer cells, which are known to burn up at least ten times as much glucose as normal cells, were draining off from the blood such quantities of this glucose that the blood-sugar was never found above normal levels. We have now located this excess sugar in the cancer cells themselves, and I contend that, unless these cells produced an enormous increase of cellular insulin, this process of growth could not go on. All this continued for a period of four and a half months. If this enormous amount of insulin had been supplied from the pancreas there would have been evidences of hypertrophy, but there were not.

7. Specimens of different animal tissues isolated from the bodies of the animals formerly possessing them have been made to live for years by Carrel and others by keeping them immersed in a carbohydrate nutritive solution. Without the aid of pancreatic insulin, but by the aid of their own cell insulins, these isolated cells perform the necessary process of carbohydrate metabolism and live and grow for years. The yeasts also present a perfect ability to perform all the functions of a complete organism, as far as carbohydrate metabolism is concerned, without the aid of pancreatic insulin. If a few yeast cells are placed in a half-tumbler of sterilised water to which glucose has been added, they will immediately proceed to metabolise the sugar with the production of heat and carbon dioxide, and in addition will be found to have deposited as much as 30 per cent. of their weight in glycogen in some cases, thus showing their ability to oxidise glucose and deposit glycogen; so that we wonder if anybody can explain how they do it—unless there is some form of insulin in their cells.

8. Efforts to extract cellular insulin from the tissues of depancreatised dogs have lately been made without success by eminent physiologists, and the conclusion has been too hastily arrived at that this settles the question of its existence. Far from it; many eminent men failed to extract pancreatic insulin for more than 30 years before Banting finally obtained it. But there are reasons why they have failed to find it, and two of these reasons are:—

(*a*) Pancreatic insulin exists in the pancreas in an inactive state in a particular chemical form; in this form it may be obtained in alcoholic extracts and used commercially. Cellular insulin, on the other hand, is produced in active form within the cell limits where it exerts its functions, and is probably entirely different chemically, and, as recent experiments have shown, cannot be extracted by our present methods.

(*b*) The attempts at extraction from the tissues of depancreatised dogs prepared after the most modern methods have all been made five days after the withdrawal of insulin.

As I have tried to show from Soskin's tables, the cellular insulin as shown by the respiratory quotient does not increase sufficiently until after ten days or thereabouts to exert its compensatory function as a necessary agent of carbohydrate metabolism, and consequently does not exist in sufficient amounts at the five-day period to be extracted, even though more suitable methods than the present ones were known and used. The evidence for the existence of this insulin may be shown in many ways besides extraction, and as that may be delayed for 30 years or more, we had better consider other methods; but in any event, let it be known that this question is not closed by these failures at extraction; on the contrary, it is wide open for further investigation.

9. Out of the mass of incessant research of the last decade, two hypotheses have appeared and gained strength which add further support indirectly to the hypothesis that insulin in some earlier enzymatic form exists in the cells of plants and lower animals and persists in the tissue cells of man in addition to the especially developed pancreatic insulin. The hypothesis that diabetic tissue still retains the power of metabolising glucose, as well as the equally important hypothesis that the pancreas is the sole source of insulin supply, have been pretty well established; but these two hypotheses contradict each other. In the diabetic dog there is no pancreas, yet much carbohydrate metabolises. Lusk, in the early days of the insulin period, denied the ability of diabetic tissue to utilise carbohydrate, basing his conclusions on the fact that (1) the respiratory quotient in depancreatised dogs 3 to 5 days after operation was 0.71, the theoretical level of fat metabolism; and (2) all carbohydrate ingested was excreted quantitatively in the urine. These conclusions were logical at that time, but are no longer sufficient to establish his hypothesis that diabetic tissue cannot consume glucose. Then, diabetic dogs lived 10 to 12 days or less; now, Soskin by improved methods has been able to make such dogs live 3 to 4 weeks without insulin or raw pancreas, with protein food alone as nutriment; and has published extensive data upon the condition of 14 such dogs. In these dogs the respiratory quotient gradually rises after 10 days and often reaches 0.90 before death. Also in these dogs the whole amount of glucose derived from the protein food is not excreted quantitatively, so that Lusk's contention no longer holds and we are forced to the conclusion that diabetic tissue can consume glucose. But this last conclusion conflicts with the hypothesis that the pancreas is the only source of insulin, and some explanation is needed to harmonise the two conflicting theories. It is therefore necessary either to abandon these hypotheses which have seemingly been established, or to accept the theory that cellular insulin exists in the cells of the tissues, since they oxidise carbohydrate—and to modify the last hypothesis by saying that the pancreas is one of the two chief sources of insulin in the body. Only by accepting this new hypothesis can we harmonise existing theories.

PHYSIOLOGY OF THE PANCREAS AS REGARDS INSULIN: RELATION TO DIABETES

The functions of the pancreas represent higher developments of the functions of simple cells. It is evidently a factory for the production of agents necessary for the digestion or metabolism of foods. These agents in the form of enzymes or hormones exist in simpler form in each cell of lower animals which have no pancreas, and in plants in which metabolic processes, resulting in the oxidation of foods with the release of energy and the discharge of carbon dioxide, take place as perfectly as in the higher organisms. It is especially important to realise this in regard to the internal secretion, insulin, which exists in simpler form in every tissue cell. Pancreatic insulin therefore is a higher development of cellular insulin. In this development a further division of labour occurs in which pancreatic insulin receives a greatly increased power of oxidising glucose, while cellular insulin retains its feebler power of oxidation but assumes the sole responsibility for the deposition of glycogen. It is believed that the other enzymes of the pancreas—trypsin, amylase, and lipase—are equally represented in the cells of lower animals, since they metabolise fats and carbohydrates as well as proteins in maintaining nutrition.

Before considering the neurogenic and humoral control of the pancreas, let us examine further the insulin of the pancreas. There is reason to believe that insulin, like trypsin, is stored in the pancreas in the form of a zymogen or, as we should call it, insulinogen, and that it remains inactive until something activates it. That this must be so may be seen by referring to the strictly scientific experiments of Clarke,[5] of Johns Hopkins, in 1916. These, briefly summarised, were as follows. The heart and pancreas were perfused separately and then together, under a perfect technique. Locke's solution was used as the perfusing fluid and this contained glucose in physiological amounts. When the pancreas was

perfused with this mixture no glucose disappeared from the solution. Yet the pancreas was full of insulin, but it was in an inactive state. When the heart was perfused the same amount of glucose disappeared as when normal blood flowed through it. In another experiment the solution was first perfused through the pancreas (from which it absorbed inactive insulin) and then passed through the heart. In this last test from 10 to 30 times as much glucose disappeared, showing that much inactive insulin was taken up by the solution while passing through the pancreas, and that this insulin became activated while passing through the heart by some agent causing glucose to disappear.

The pancreatic insulin as it exists in the pancreas, as well as in our pharmaceutical product, is inactive until it leaves the pancreas. This brings up a most serious question in the ætiology of diabetes. Is the diabetes caused by deficiency of insulin or by a derangement of the activating mechanism? The chemical formula of this inactive pancreatic insulin (insulinogen) must be different from that of tissue insulin which is produced within the cell in an active state and performs its metabolic functions within the cell limits. Hence, failure to extract active insulin from tissue cells by the same process as has been used for the extraction of inactive insulin in the form of insulinogen fails to prove that such tissue insulin does not exist in the tissue cells, especially as metabolic data show that such insulin must be present to account for the metabolism taking place in depancreatised dogs.

Either the activating agent of insulin must be produced within the tissue cells as a co-enzyme and sent out into the surrounding media to produce oxidation, or the inactive insulin must enter the cells; or else the insulin must become activated at the time of its discharge from the pancreas when it becomes freed from the inhibiting effect of trypsinogen, discharge being brought about by neurogenic impulses caused by high blood-sugar, or by the influence of the duodenal hormones, secretin and duodenin. However uncertain the preceding conditions may be, the fact remains that pancreatic insulin requires an activator, and the serious question of whether the pre-insulin or the activator is deficient, and hence the cause of the diabetes, still remains to be answered. In insulin-resistant cases of diabetes it seems probable that it is the activator which is lacking, since there is always an abundance of injected insulin present in the body.

The production of the various enzymes of both the external and internal secretions of the pancreas is a vegetative function of the individual cells, whether acinar or insular in nature. These cells become filled with granules (Bensley) which disappear during the fasting periods. The discharge of these enzymes from the pancreas is brought about by nerve stimuli transmitted from the central nervous system through the vagus nerve to the individual cells, and by certain hormones formed in the mucosa of various parts of the alimentary tract during the active stages of digestion. These pathways of control are called the neurogenic and the humoral. The humoral control is the main and usual stimulant of the discharge of the pancreatic agents, whereas the neurogenic stimuli are only required for the finer adjustment of the supply of enzymes as required by the economy.

Humoral control.—The action of secretin is of the greatest importance. Physiologists agree that it is formed in various parts of the alimentary tract by the action of a weak acid on the epithelial cells lining that tract. They agree that its action stimulates the flow of the gastric juice, the pancreatic juice, the bile, and the succus entericus. Until two years ago it was also believed to stimulate the internal secretion and thereby increase the flow of insulin into the blood, but this theory is no longer tenable, as will be shown. The usual source of secretin is the duodenal mucosa, but this also contains other hormones which have separate actions, and since these have often been present in secretin preparations used for experimental purposes the results were incorrect, and some things were ascribed to the action of secretin which were due to these other hormones existing as impurities. For this reason Banting and La Barre both thought that secretin must also cause discharge of the internal secretion, insulin, since in their experiments the blood-sugar fell. Still,[6] however, succeeded in extracting a pure secretin, and with this there was no fall of the blood-sugar. La Barre took part in these latter experiments and agreed to the result, so that it can now be definitely stated that secretin does not cause the discharge of insulin into the blood. But it also appears from these experiments that something contained in duodenal extracts does cause the discharge of insulin and a fall of the blood-sugar, and this something I will call "duodenin" for purposes of identification.

The humoral control of the pancreas, then, is brought about through the action of secretin, duodenin, and perhaps other as yet unknown hormones. These cause the outflow of both the external and internal secretions, and their production in the mucosa of the alimentary canal is dependent upon the entrance of food into the canal and the inauguration of the normal processes of digestion during which dilute hydrochloric acid is liberated in the stomach. But one more point must be noted in regard to the discharge of the internal secretion. Whereas secretin alone causes the discharge of the external ferments in the pancreatic juice, both secretin and duodenin acting together are necessary for the discharge of insulin into the blood. This will be shown in a later article by a series of experiments which I have performed to demonstrate this fact, although the early experiments of both Banting and La Barre prove the point; their trials, however, were by hypodermic injection while mine were entirely by mouth. It follows therefore that a deficiency of either secretion would result in a deficiency of insulin in the blood through a diminished discharge from the pancreas.

Neurogenic control.—Although the humoral control is the main and usual one, the neurogenic in a compensatory way is often called upon to help out both in health and in diabetes. Any unusual rise in the blood-sugar stimulates the insulin centre in the brain and directly causes the discharge of insulin with a fall of the blood-sugar, as shown by the experiments of La Barre which were approved by Macleod.[7] In health there may be an unusually large and rapid absorption of carbohydrates from the food of the meal, raising the blood-sugar unduly. In diabetes (untreated) there is a permanently excessive rise. In both cases the neurogenic stimuli are brought into play as compensating agents increasing the discharge of insulin into the blood; but with this difference that in diabetes this nerve action must be kept up for months or years, so that it is easily conceivable that either the insulin centre or the conducting filaments of the vagus, or both, might become exhausted or even paralysed by this continuous over-stimulation, thus eliminating entirely

the compensatory help of the nerve stimuli to the humoral agents and accounting for progressive deterioration in cases of untreated diabetes.

CORRELATING THE INSULINS

Finally, in correlating these facts in relation to diabetes, we must remember that pathological studies of the last few years have all shown that degeneration of the islands of Langerhans can no longer be considered the common cause of diabetes. The degeneration does not correspond to the severity of the disease. In children and acute cases the pancreas remains practically normal. In cases of long duration the degeneration is slight and no more than can be found in any other long exhausting disease affecting the nutrition of the cells. So that the pancreas may be sufficiently normal and yet a severe diabetes exist; and it is evident from our preceding study of the physiology of the pancreas in regard to insulin that any derangement of either the humoral or the neurogenic control of the discharge of insulin into the blood may cause a diabetes.

From the preceding study of the effects of the different stimuli through the neurogenic and humoral pathways upon the discharge of insulin from the pancreas, it is evident that it can only occur during the absorptive period following meals, because it is food, and the elements developed in its digestion, which bring into existence the humoral stimuli of insulin discharge; and it is the absorbed food which raises the blood-sugar and provides the neurogenic stimulus to this discharge of pancreatic insulin. So that both controls of pancreatic insulin depend directly upon the food of the meal.

Let us consider what happens commonly during the period from supper time at 6 P.M. to breakfast time at 6 or 7 A.M. From 6 P.M. to 9 P.M. the food is digesting normally in the alimentary canal and the humoral stimulants, secretin and duodenin, are being normally produced. During this same period the blood-sugar is first rising and then falling back to normal, and is producing its neurogenic effect on the discharge of insulin. But at the end of this period all food has passed out of the stomach and through the duodenum to parts beyond, and the blood-sugar has returned to normal, so that neither by the humoral nor by the neurogenic pathways can any more pancreatic insulin be brought into play. Furthermore, the fact that the blood-sugar has returned to normal shows that the pancreatic insulin produced for the meal has been thoroughly used up, and therefore no action from it upon the blood-sugar can continue after 9 P.M. This gives a clear field of nine hours' duration in which to study the action of the other or cellular insulin. The blood-sugar, during these hours of the night, would naturally rise above normal because the internal metabolism continues to throw sugar into the blood from the continuous breakdown of protein into amino-acids; and a continuous outflow of lactic acid takes place from the heart, respiratory and all involuntary muscles into the blood, from which the liver manufactures new sugar (gluconeogenesis), and there is an addition of sugar from the glycogen depôts when needed. If there were no insulin action at all during these hours, the blood-sugar would rise far above normal, as in diabetes. The very accurate experiments of Trimble and Maddocks,[8] however, show that there is no rise of the blood-sugar during the night in normal individuals; 24-hourly tests were made on nine medical students. The variation during the night lay between 93 and 97 mg., and the sugar curve was almost a straight line. From the above facts I draw the conclusion that cellular insulin alone controls the blood-sugar during the fasting periods, while pancreatic insulin exerts its powers only during the absorptive periods.

It is estimated by Cori[9] that only 38 per cent. of the carbohydrates are oxidised by pancreatic insulin; this leaves 62 per cent. to be either oxidised or converted to glycogen by cellular insulin or to be converted to fat. Since both glycogen and fat formation are much reduced in diabetes, it suggests that cellular insulin is likewise sadly deficient in that state. It should also be noticed in this connexion that whereas the direct stimulation of cellular insulin by the intravenous injection of glucose as used by Thalhimer produces a great increase of cellular insulin and fall of the blood-sugar, the high blood-sugar of diabetic states, existing for months or years, produces no such effect because for some reason the cellular insulin cannot be stimulated.

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NEMBUTAL IN LABOUR

A RECORD OF ONE HUNDRED CASES OF NEMBUTAL AND CHLORAL NARCOSIS

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THE following is an analysis of 100 consecutive cases of nembutal and chloral given to women in labour in the obstetric unit at University College Hospital. Acting on the experience of O'Sullivan and Craner[1] the following rules were formulated:—

A. Nembutal grs. 3 to be given to *primiparæ:* (1) when the os uteri is about three fingers' dilated and there are fairly strong pains at about five minutes' interval; (2) if the patient is distressed with strong pains, even if they are not occurring every five minutes, and the os three fingers' dilated.

B. Nembutal grs. 3 to be given to *multiparæ:* when the os uteri is about two fingers' dilated if there is distress. Nembutal grs. 1½ to be repeated once after three hours if labour is progressing and the pains are strong and regular. Chloral hydrate grs. 22 in all cases to be given twenty minutes after each dose of nembutal.

These doses vary a little from those given by O'Sullivan and Craner. They gave grs. 30 of chloral hydrate ten minutes after the initial dose of nembutal grs. 3, and their first repeat dose of nembutal grs. 1½ after two hours, and subsequent doses of both chloral hydrate and nembutal after three hours, up to but not exceeding a dose of grs. 7½ of nembutal in twelve hours. The modification in this series was considered advisable because the administration, timing, and dosing were left to the discretion of the labour ward sister. When it was found necessary to exceed the dose of nembutal, grs. 4½, medical permission was obtained. Chloroform or gas-and-oxygen was, with rare exception, given in all cases for delivery.

* Working with a grant from the Medical Research Council.

[1] THE LANCET, 1932, i., 119.

Women admitted in labour have, in normal cases, two vaginal examinations: on admission and when the membranes rupture. Therefore it is often difficult to state with accuracy the exact stage of dilatation of the os uteri when the first dose was given. For this reason in this analysis the times are worked out in hours before delivery.

In some cases, when the patients were admitted very early in labour before the pains were regular or frequent, ℥ 1 of the following mixture was given, in addition to a subsequent dose, or doses, of nembutal and chloral: pot. brom., grs. 25; chloral hydrate, grs. 25; tinct. opii ♏ 7½; aq. chlorof. ad ℥ 1.

There was no alteration in the ordinary management of the first or second stage of labour, except that after the administration of the nembutal the patients were not allowed out of bed. They were encouraged to sleep, but no precautions were taken to darken the room or ensure more than ordinary quiet. Further, the fœtal heart was examined hourly and frequent blood-pressure records were made. Patients well under the sedative and sleeping quietly were frequently left alone for a few minutes at a time; mention will be made later of the restlessness sometimes met with, in which it was impossible to leave the patient at all.

THE PATIENT'S POINT OF VIEW

Each patient was talked to about 24–48 hours after delivery. All could remember being given some drug to drink, and whether or not there was any change in the pain after it. It is interesting to note that the same phrases occurred again and again in these women's description of their labours. "I went to sleep at once and I didn't remember anything till I heard the baby cry." "All I remember was being given stuff to smell." "I felt things as though it was a dream, and there was no pain at all." "I was helped a lot." "It made the pain worse and the baby came at once." There is a large clock in each labour ward, and one or two of the more intelligent women could remember the time they were "given their drink" and the time when they woke up again. This was unusual.

Of these 100 cases, 62 were completely successful from the patient's point of view. The cases were classified in five groups as follows:—

(*a*) *Very good*, 35. Complete or almost complete amnesia and complete analgesia.
(*b*) *Good*, 27. Marked but incomplete amnesia and complete analgesia.
(*c*) *Fair*, 21. No amnesia, but definite analgesia.
(*d*) *Poor*, 4. No amnesia, slight analgesia, quickly passing off.
(*e*) *Failures*, 13. Neither amnesia nor analgesia.

From these figures, therefore, in 62 cases the desired effect was obtained, in 21 the effect was very incomplete, and in 17 the drug was without effect.

(*a*) Of the 35 *very good* cases 31 were primiparæ and 4 multiparæ; the average age was 22·3 years; 24 were placid in temperament and 11 were nervous; 23 had been in hospital under 12 hours before delivery, 7 between 12 and 24 hours, and 5 over 24 hours. Twenty-nine of the 35 cases had a single dose of nembutal grs. 3, followed in twenty minutes by chloral hydrate grs. 22; 18 of these 29 had the drugs within 3 hours of delivery, 8 within 3 and 5 hours, and 3 over 5 hours before. It is interesting to note here that in the last 3 cases there appeared to be a definite susceptibility to the drug, since in each case the pain intervals were lengthened slightly and the patients were deeply asleep. Two required no chloroform for delivery. The actual time of administration in these 3 cases was 7¾, 6, and 6 hours respectively.

Five of the 35 cases had nembutal grs. 1½ and chloral hydrate grs. 22 in addition to the initial dose of nembutal grs. 3 and chloral hydrate grs. 22. In four cases the initial dose was given over 6 hours before delivery and the repeat dose under 3 hours before; in the remaining case the initial dose was given 10 hours and the repeat dose 6 hours before delivery. In the remaining one of these 35 cases nembutal grs. 7½ and chloral hydrate grs. 44 was the total dose given in 15 hours, the initial dose being given 21 hours before the birth of the child. This was the largest total dose in any of the 100 cases in the whole series.

(*b*) Of the 27 *good* cases 22 were primiparæ and 5 multiparæ; the average age was 25 years; 16 were placid in temperament and 11 nervous; 13 had been in hospital for 12 hours before delivery, 8 between 12 and 24 hours, and 6 over 24 hours. Twenty-one of the 27 cases had a single dose, grs. 3 of nembutal, followed by grs. 22 of chloral hydrate. Nine of the 21 had the drugs within 3 hours of delivery, 7 between 3 and 5 hours, and 5 over 5 hours before delivery.

Five of the 21 had a total dose of nembutal grs. 4½ and chloral hydrate grs. 44, the repeat dose being given 3 hours before delivery. The remaining one of the 21 cases had a total dose of nembutal grs. 6, chloral hydrate grs. 66, the initial dose being given 20 hours before delivery and the last repeat dose 5 hours before.

(*c*) Of the 21 *fair* cases 14 were primiparæ and 7 were multiparæ; the average age was 26·6. Fourteen were placid in temperament and 7 were nervous; 6 had been in hospital under 12 hours before delivery, 7 under 24 hours, and 8 over 24 hours. Seventeen of the 21 cases had a single dose grs. 3 of nembutal followed by chloral hydrate grs. 22. Seven of the 17 had the drugs within 2 hours of delivery, 3 between 3 and 5 hours, and 7 over 5 hours before delivery. The remaining 4 of the 21 cases had a total dose of nembutal grs. 4½, chloral hydrate grs. 44, the repeat dose being given within 3 hours of delivery.

In 6 of these 21 cases the dosage and times of administration coincided with those in which "good" or "very good" results were obtained—i.e., in the first 62 cases. The pains were not weakened and labour was normal. There was no apparent reason for the absence of amnesia and the incomplete analgesia. In 2 of the 21 cases there were exceptionally strong pains. In 5 cases the drug was given late in labour owing to the weak and infrequent pains throughout. In 4 cases the pains, from the administration of the initial dose of nembutal, were definitely weakened, therefore the repeat dose was not given. In 4 cases the drug was not repeated because after the first dose the patients became extremely restless and noisy.

(*d*) In the 4 *poor* cases 2 were primiparæ and 2 multiparæ; all were very nervous in temperament. The average age was 24·9 years. Two were admitted within 12 hours of delivery, and each had a single dose grs. 3 of nembutal followed by grs. 22 of chloral hydrate, 3 hours before delivery. There was no obvious cause for the failure to produce analgesia in these two cases; the pains were unaffected in strength and frequency by the drug, but the patients became more nervous as labour progressed. The remaining 2 of these 4 cases were admitted over 24 hours before delivery, and each had the usual single doses of nembutal and chloral, in each case over 5 hours before. The repeat dose of nembutal and chloral was not given because the pains were weakened after the initial dose and the patients became very noisy.

(*e*) In the 13 cases grouped as *failures* 12 were primiparæ, 1 a multipara; the average age was 29·6 years; 4 were placid in temperament, 9 very nervous; 3 were admitted to hospital within 12 hours before delivery, 5 under 24 hours, and 5 over 24 hours before delivery. In 10 of these 13 cases the usual dose of nembutal and chloral was given, in 3 cases within 3 hours, in 1 case within 5 hours, and in 6 cases over 5 hours before delivery. In 2 of the 13 cases nembutal grs. 1½ and chloral hydrate grs. 22 were repeated within 3 hours before delivery. In the remaining case the initial dose was given 10 hours before and nembutal grs. 3 and chloral hydrate grs. 22 were repeated 5 hours before delivery.

Of these 13 cases, all of which were complete failures, there were 3 in which the drugs were given too late, within half an hour of delivery. In 3 cases the repeat dose was withheld because after the initial dose the pains became weaker and less frequent. One of these cases terminated

in a forceps delivery. In 5 cases the repeat dose was withheld because of the extreme lack of control and restlessness induced by the initial dose in women already hysterical.

In 2 cases no apparent cause was detected for the lack of amnesia and analgesia. Both cases were quiet and easily manageable, in both the pains continued unaffected, but both women insisted that they felt severe pain throughout. They were placid and intelligent women.

THE ATTENDANT'S POINT OF VIEW

At University College Hospital women in labour are examined in the admission-room. They are then transferred to the first-stage ward, which is capable of accommodating three women, and when in the second stage are transferred to a second-stage ward. The labour wards (second-stage wards) have only one bed. A normal labour is under the supervision of the labour ward sister only.

It was not found necessary to vary these arrangements with regard to patients under nembutal and chloral, except in the cases which were very restless. These were moved from the first-stage ward to the second-stage ward rather sooner than usual and not left alone. Those who responded well were left for a few minutes at a time. No case gave rise to particular anxiety. There was no fall in blood pressure or undue narcosis produced by the drugs. No case became maniacal. From the attendant's point of view the patients have been divided into four groups.

(*a*) *Easy to manage*, 61. These patients slept between their pains, and responded to instructions when required. They could be roused to be examined, but when left alone slept quietly. With the pains they were roused, and were rather more apt to wriggle than the usual patient without nembutal. They were not noisy, but there was a tendency to weeping and lack of control.

(*b*) *Fairly easy*, 12. These patients were drowsy between their pains, but were noisy with the pains, and could not be roused as easily to make use of the pains.

(*c*) *Difficult*, 17. The patients were noisy and restless, weeping and miserable even between the pains.

(*d*) *Very difficult*, 10. These cases were extremely noisy and restless. They required constant attention and would not respond to directions in any way.

The disposition of the patient apparently made a difference. In (*a*) 47 were placid, 14 nervous; (*b*) 6 were placid, 6 nervous; (*c*) 5 were placid, 12 nervous; (*d*) 0 were placid, 10 nervous. This statement is of course not absolute, as in the "difficult" group there were 5 patients who were placid and quiet though distressed with the pains. After the administration of nembutal and chloral they became noisy and restless. It was found, however, to be a good working rule that placid patients would respond well, and the labour ward sisters, after some experience with the drug, could foretell fairly accurately which patients would be troublesome during the second stage. At this point it is interesting to note that the disposition of the patient has apparently a definite bearing on the success or otherwise of the drug from the patient's point of view. Of the 62 successful cases from the patient's side, 40 were placid in nature and 22 nervous, while in the 17 cases in which the drug was found to be without effect 4 were placid and 13 very nervous. Further, in 5 of these 13 cases, the nervousness was made worse by the initial dose of nembutal so that the repeat dose had to be withheld. Even though a patient became restless and unhappy after her first dose of nembutal and chloral it by no means followed that the amnesia would be incomplete. One or two of the worst cases of restlessness, which were exceedingly noisy throughout, had nearly complete amnesia. "They tell me I made a noise, but I don't remember anything about it." Hence it seems fair to argue that a repeat dose given to the restless patients would have produced a certain degree of success. It was, however, impossible to give this dose because of the fear that the patients would roll off the bed; further, they could not be induced to make use of their pains.

One patient was rather more than usually sleepy next day; the others were perfectly normal. They all slept through the third stage. Chloroform or gas-and-oxygen was given for the deliveries in all cases except two, the average time of administration being about ten minutes, just for the actual predelivery pains, crowning, and birth of the head and shoulders. About ℥ 20–30 of chloroform was usually required. This amount was of course increased for forceps delivery. The number of perineal tears resulting was small. The temperature, pulse-rate, and blood pressure of the patients after delivery were apparently not affected by the nembutal and chloral.

EFFECT ON THE PAINS

In 71 cases the strength and frequency of the pains were unaffected. Labour progressed normally and delivery took place within the expected time. In 9 cases there was considerable strengthening of the pains following the nembutal and chloral, and delivery took place with some rapidity. As this occasionally happens with patients who have had no preliminary sedative it seems doubtful if the strengthening should be regarded as a direct effect of the drug. O'Sullivan and Craner, in their series of 60 cases, had 3 in which a similar strengthening was observed.

In 20 cases labour was apparently lengthened. In 7 of the 20 the frequency of the pain was diminished, the intervals between pains lengthening from about three to five minutes, or four to six minutes. In 8 the strength was diminished. In 5 both strength and frequency were diminished. Fourteen of these 20 cases terminated in spontaneous deliveries, and the lengthening of the second stage gave rise to no anxiety. Six cases terminated in forceps deliveries. Forceps were applied for weakening pains and a lengthy second stage.

In this series of 100 cases there were 10 forceps deliveries. In 6, as stated above, forceps were applied for delayed second stage owing to weakening pains, but in 4 of the 6 the membranes ruptured very early, and it seems fair to assume that labour would have been long whether or not nembutal had been given. In the remaining 4 cases there was no weakening of the pains; in 1 of them there was some disproportion and the case was a trial labour, and in 3 the position was an unrotated occipito-posterior. The average for forceps deliveries at University College Hospital is about 9 per cent.; this series, therefore, shows a slight increase. In spite of the prolonging of the labour 9 of these 20 patients had complete analgesia, 5 had fair but incomplete relief from the pain, 3 had very slight analgesia, and 3 had none at all.

EFFECT ON THE CHILD

In 79 of the 80 cases of unprotracted labour there was no anxiety with regard to the child. The babies all cried at once and were normal in every respect. In the remaining case the child was born in white asphyxia but was resuscitated fairly easily. In 16 of the 20 cases in which labour was prolonged the babies gave rise to no anxiety. In 3 of the 20 cases the following notes were made:—

Case 51.—Child slightly blue. Easily and quickly recovered. Forceps delivery under full chloroform.

Case 55.—Child slightly blue. Quickly recovered. Chloroform for delivery.

Case 99.—White asphyxia. Fairly easily recovered. Forceps delivery under full chloroform.

In one case there was a stillborn baby. Throughout labour, pains were strong but progress slow. Nembutal grs. 7½ and chloral hydrate grs. 44 were given in 15 hours, starting 21 hours before the birth of the child. The first repeat dose was given 16 hours before delivery, but before that the fœtal heart could not be heard. Extract from the post-mortem report: "Cause of death—asphyxia." It seems questionable, therefore, if the nembutal had any bearing on the stillbirth.

CONCLUSIONS

From this analysis of 100 cases it seems fair to conclude that nembutal, given in combination with chloral, is of undoubted value in labour. (1) It seemed to be of most use in placid or fairly placid women whose pains were strong and distressing; (2) it was most effective when given between 3 and 5 hours before delivery, and (3) when the patients had not been admitted more than 8–12 hours, so that labour was well established before the women had to be kept completely in bed; (4) on the other hand, it was found to be of very doubtful value in nervous or hysterical patients, both from the lack of analgesia resulting and the extreme restlessness induced.

Nembutal grs. 3 in capsules given by the mouth and followed by chloral hydrate grs. 22 as a syrup, grs. 11 to the drachm, were found to be perfectly safe. In no case, with the repeat dose (nembutal grs. 1½ and chloral hydrate grs. 22) in three hours, was there any suggestion of overdosing; indeed most of the 21 cases classed as "fair" would probably have been successful as regards analgesia if the drug had been pushed.

Without the general anæsthetic for delivery there would not have been such complete amnesia in the "very good" cases. Most people, however, agree that the worst pain is felt not when the child is actually being born, but when the head is descending through the pelvis. Therefore a considerable amount of relief could be obtained in ordinary cases without chloroform.

These results would probably be better in domiciliary midwifery, where one nurse stays with the patient all the time and where quiet and freedom from disturbance can be ensured.

EFFECT OF ADRENALINE IN CERTAIN MUSCULAR DISORDERS

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The cause of the muscular wasting and weakness which are the outstanding symptoms of the myopathies has been the subject of much speculation since their separation by Erb from the cases of muscular wasting of nervous origin.

It is generally recognised that though they assume a somewhat varied clinical picture according to the muscle groups first affected, the age of onset, the rate of progress, and the presence or absence of pseudohypertrophy, the various sub-groups of myopathies are probably but different aspects of the same disease. An exception to this generalisation is to be made in the case of dystrophia myotonica, which, while showing features common to the other forms of myopathy, presents a picture sufficiently distinct clinically and pathologically to entitle it to be regarded as a separate entity. Equally obscure in its ætiology and pathology is myasthenia gravis, which also presents as its outstanding symptom a characteristic disorder of muscle function.

It is not proposed in this paper to discuss the merits of the numerous theories that have been put forward from time to time as to the underlying cause of the myopathies and myasthenia gravis; but there has been of recent years a tendency to attribute the muscular dysfunction to a defect in the autonomic nervous system which is known to supply the voluntary muscles through their sympathetic fibres. Direct evidence for this theory is lacking, but as the function of the sympathetic fibres to voluntary muscles is largely unknown, it cannot be summarily dismissed.

AN INVESTIGATION

The object of the investigation here reported was to determine if there is any evidence of abnormal response in the muscles to sympathetic stimulation. For this purpose the blood lactic acid and its changes after a subcutaneous injection of 1 mg. of adrenaline was used.

It is known that following an injection of adrenaline there is a sharp rise in the blood lactic acid, and that the additional lactate is derived from muscle glycogen. The mechanism of production of lactic acid from muscle glycogen by means of adrenaline is subject to some doubt. Langley's law of the identity of adrenaline and sympathetic effects would suggest that it is due to stimulation of the autonomic nerves in muscle, but it has also been suggested on experimental grounds that the stimulus acts directly on the muscle cell. Be that as it may, it seemed, a priori, possible that the disturbance of structure and function manifested in these diseases might be reflected in a defective response to adrenaline. In view of the fact that in many of these cases a large proportion of the muscular system was affected by the disease, it was not unreasonable to suppose that at least a quantitative difference in the height of the increase of blood lactate might occur.

The cases were grouped as follows:—

(*a*) Six control cases of male patients suffering from a variety of diseases unassociated with any known changes in the muscles.

(*b*) Three cases of severe progressive muscular atrophy in which advanced muscular wasting of nervous origin was present.

(*c*) Three cases of myopathy in which advanced muscular wasting was present, two of the Landouzy-Dejerine and one of the Erb type.

(*d*) Six cases of dystrophia myotonica of varying severity.

(*e*) Three cases of myasthenia gravis.

In all cases the clinical diagnosis appeared to be beyond dispute and the details of their states are omitted.

In addition to blood lactate, blood-sugar was estimated in capillary blood. This was done firstly as an index of the glycogenolytic response in the liver, and secondly because it has been asserted at various times that muscle diseases are associated with disturbances of carbohydrate metabolism. The blood-sugar was determined by MacLean's method, and the blood lactate by that of Friedmann, Cotonio, and Shaffer.

The patient was given a light breakfast (tea without sugar and toast) between 7.30 and 8 A.M., and the

experiment was commenced at about 10.30 A.M. Blood for blood-sugar was taken from the capillaries of the finger, and that for blood lactate from the median basilic vein without stasis, no anticoagulant being used. Having taken the pulse, 1 mg. adrenaline hydrochloride was injected subcutaneously. In all cases a marked rise in pulse-rate occurred, accompanied by pallor, palpitation, and slight subjective distress. Blood samples were taken at hourly intervals, for three hours, the patient in the intervals being kept at complete rest either in bed or in a wheel chair.

The results obtained are classified in the accompanying Table, and only averages for each group are given. Blood lactate and blood-sugar are both given in mg. per 100 c.cm. Figures in parentheses are rises above initial levels.

Averages of Blood Lactate

Time after adrenaline	Controls.	Dystrophia myotonica	Progressive muscular atrophy.	Myasthenia gravis.	Other myopathies
Hour	6 cases	6 cases	3 cases	3 cases	3 cases
0	19	18	15	14	18
1	31 (12)	23 (5)	26 (11)	27 (13)	25 (7)
2	24 (5)	21 (3)	18 (3)	17 (3)	18 (0)
3	19 (0)	14 (–4)	15 (0)	13 (–1)	15 (–3)
Averages of Blood-sugar					
0	84	93	110	74	82
1	148 (64)	132 (39)	130 (20)	152 (78)	123 (41)
2	144 (60)	133 (40)	162 (52)	127 (53)	125 (43)
3	108 (24)	114 (21)	115 (5)	71 (–3)	79 (–3)

In the group of progressive muscular atrophy is included one very severe case, in the last stages of the disease, which gave no rise in blood-sugar after adrenaline, but the rise in lactate was of the type shown in the averages for this group. Probably this was due to almost complete depletion of liver glycogen. The blood-sugar values in this case were omitted from the averages, but the lactate values were included.

SUMMARY OF RESULTS

1. In all the cases a definite rise in blood lactate occurred, but quantitatively there were certain suggestive differences in the various groups. The controls and the cases of progressive muscular atrophy and myasthenia gravis gave almost identical responses —viz., a rise of 11–13 mg. per 100 c.cm. in the first hour, a still definite rise of 3–5 mg. after two hours, and a return to initial values at the end of three hours. In the cases of dystrophia myotonica and other myopathies, the rise in lactate was 5–7 mg. per 100 c.cm. after one hour, and after two hours it was only 0–3 mg. After three hours the values were below the initial.

2. The hyperglycæmia in the controls and cases of dystrophia myotonica, whilst of different proportions, continued for three hours, at which time the blood-sugar was 21–24 mg. per 100 c.cm. higher than the initial values. In all the other cases the hyperglycæmia was of shorter duration, although no important difference in the maximum rises was detected.

3. The resting lactic acid in the blood of all the cases was within normal limits. The resting blood-sugar in the cases of myasthenia gravis was lower than in any other group.

No theoretical conclusions can be drawn from these findings at this stage of our investigations, and our object in presenting them has been to draw attention to the fact that such quantitative aberrations from the normal as do occur in the blood lactate response are present only in the cases of dystrophia myotonica and the myopathies.

This work was done during the tenure by one of us (J. St. C. E.) of the E. G. Fearnsides research scholarship of the University of Cambridge.

THE CLINICAL MANIFESTATIONS OF HYPOCALCÆMIA IN RENAL FAILURE[1]

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When for any reason the function of the kidney becomes sufficiently impaired to produce nitrogen retention in the blood a diminution in the serum calcium also becomes apparent. Many authorities have commented on this hypocalcæmia—de Wesselow, Salvesen and Linder, Marrack and Thacker, Schmitz, Izod Bennett, and others. The serum calcium is also reduced in those cases of renal disease without nitrogen retention which are now usually grouped together as "nephrosis." In my own experience of this somewhat rare condition I have observed hypocalcæmia on several occasions, and similar findings have been reported by Achard and Ornstein, Scriver, Salvesen and Linder, Peters and Eiserson, and others. The hypocalcæmia of nephrosis is probably an effect of the diminution of the plasma proteins which is constantly present in this condition.

But the hypocalcæmia of renal insufficiency is an entirely different type of biochemical phenomenon. It is much commoner, much more marked, and is due to quite different causes. Table I. illustrates the condition :—

TABLE I

Case.	Urea.	N.P.N.	Ca.	Case.	Urea.	N.P.N.	Ca.
A. B.	50	46	8·7	K. L...	380	200	6·4
C. D.	150	87	7·1	M. N. (*a*)	66	50	9·7
E. F. (*a*)	200	120	7·6	M. N. (*t*)	215	130	5·7
E. F. (*t*)	450	240	6·0	O. P...	170	98	9·5
G. H.	525	300	8·4	Q. R.	340	195	7·7
I. J.	620	335	7·3				

(*a*) on admission ; (*t*) terminal.
N.P.N. = non-protein nitrogen.

This table demonstrates hypocalcæmia in every case, and often of severe degree, and although these are selected cases chosen to illustrate this paper it will be found, whenever a group of patients with considerable nitrogen-retention is examined, that with very few exceptions the blood calcium is considerably reduced. This fact immediately raises two important questions : (1) in what manner is the reduction of the blood calcium produced ; and (2) are any of the symptoms of renal insufficiency directly attributable to this particular chemical phenomenon ?

CAUSATION OF HYPOCALCÆMIA IN RENAL INSUFFICIENCY

No completely satisfactory explanation of the hypocalcæmia of renal insufficiency is possible at the present date. Many observers such as Marriott and Howland and de Wesselow have considered it to be an effect of the accumulation of phosphorus in the blood, and it is quite certain that in terminal renal

[1] A communication read to the Congrès de l'Insuffisance Rénale, Evian, France, in September, 1933.

failure it is usual to find the increase in the blood phosphorus running somewhat parallel to the diminution in the blood calcium. Table II. taken from my own cases is illustrative of this :—

TABLE II

Case.	Urea.	Ca.	Phos.
K. L. ..	380	6·4	12·0
	260	9·0	8·7
E. F. ..	150	7·6	5·9
	450	6·5	17·5
G. H. ..	525	8·4	15·6
I. J. ..	620	7·3	11·4

At the same time careful inquiry by many biochemists has not led to the general acceptance of the theory of phosphorus retention as being an altogether sufficient explanation of hypocalcæmia. Another explanation frequently offered is that the hypocalcæmia is an effect of acidosis. It is known that any notable diminution in the alkali reserve of the blood is accompanied by a reduction in calcium. It is also well known that many cases of renal failure are accompanied by a considerable acidosis. But many exceptions to this rule are found, and I have frequently observed cases of early renal insufficiency with hypocalcæmia well marked but with the alkali reserve of the blood remaining fully normal; further, it must be noted that it is often possible to restore the alkali reserve to normal for long periods without in any way abolishing hypocalcæmia. The observations of Weil and Guillaumin and of Mogena and Orcoyen support this view. The factor of acidosis must, however, be constantly remembered because its appearance in the late stages of renal insufficiency may convert a pre-existing mild hypocalcæmia into a severe one. This aspect of the problem is further discussed below.

Certain workers, such as Ambard, might seek to explain the hypocalcæmia of renal insufficiency as an effect of "dry salt retention." I am unable, from personal investigation, to support or refute this theory because up to the present I have never observed changes in the blood chlorides which would suggest that salt retention offers the correct explanation.

As regards the blood pressure, it has long been known that extreme hypertension frequently accompanies renal insufficiency, but observations on this subject, particularly in England and America, demonstrate that pure hypertension, without evidence of renal involvement, is not accompanied by any alteration in the calcium content of the blood. Similarly, it is doubtful whether nitrogen retention alone creates hypocalcæmia because many cases of obstruction to the urinary tract, such as prostatic obstruction, are accompanied by considerable nitrogen retention often without marked lowering of the calcium content.

SYMPTOMS POSSIBLY DUE TO ABNORMAL CALCIUM METABOLISM

It would seem difficult, in the absence of exact knowledge as to the mechanism of the production of hypocalcæmia, to answer with any certainty the question whether any of the symptoms of renal failure are attributable to disturbances of calcium metabolism. At the same time careful observation suggests that there are, amongst the manifold symptoms of renal failure, certain ones which can properly be ascribed to the changes in the blood calcium.

Amongst such symptoms are those in which the patient suffers from muscular cramps. The following is a striking example :—

S. T., female, aged 43, seen by me on Feb. 24th, 1932. Patient had been a very healthy woman; had had two normal pregnancies, the youngest child being now 12 years old; she had never had œdema or other medical complications of pregnancy. She was an athletic woman who played games of all sorts. In June, 1931, she noticed slight cramps in her arms and in her feet whilst playing golf. These continued rather frequently, but it was not until the middle of January, 1932, that they became so severe as to interfere with her game; at the same period she noticed herself a little breathless at the end of a round of golf.

On the following day, whilst paying a call, the cramps became very severe, particularly in the thighs; she was just able to get home and to bed; the adductor muscles of the thighs were hard and painful with spasm which did not pass off for some hours and then left the legs very tender, actual bruises appearing three days later. These severe cramps continued for some days, so affecting the abdominal muscles as to make her vomit.

Her blood pressure was found to be above 200, and a considerable quantity of albumin was present in the urine. Calcium gluconate given by mouth with rest in bed quickly relieved the cramps which became minor in character. There had been some nocturnal polyuria ever since birth of second child, but she had never had headaches, and there had been no gastro-intestinal upset apart from the vomiting caused by the abdominal cramps. A specimen of blood taken 10 days previously showed the blood-urea to be 160, and calcium below 7·0.

When consulted I instituted a severe low nitrogen diet and the following figures give the course of the case :—

—	Feb.	Mar.	April.	May.	July.	Sept.
N.P.N... ..	97	63	57	69	76	87
Urea	158	85	82	88	130	150
Calcium. ..	8·5	8·4	9·4	7·7	7·8	7·1
Phosphorus ..	5·6	—	—	6·6	7·3	8·6
Alkali reserve..	—	—	—	—	—	51
Notes ..	Cramps less*	—	Cramps gone.	—	—	Cardiac failure†

* B.P. 200/120. † B.P. 220/130.

The patient died of cardiac failure and pulmonary œdema; there were no cramps during the last three months of life.

Such cases are by no means common, but milder degrees of cramp in the large muscles are often observed by the careful clinician, and it is probable that the twitching of the extremities, unaccompanied by pain, which is so often seen in one group of uræmic patients, is only another manifestation of hypocalcæmia. It will further be observed that an exaggeration of the tendon reflexes often becomes more and more noticeable as renal failure progresses towards uræmia, and here again it would seem that hypocalcæmia is an important factor in the production of this phenomenon. The following is an example of this :—

E. F., male, aged 29, consulted me at Middlesex Hospital in January, 1922. Three weeks previously he had had some pain in the chest and back for 12 hours and seven days later complained of a "rushing" feeling in his head. Beyond this he had no symptoms. On examination heavy albuminuria, no œdema, normal retinæ, no gastro-intestinal symptoms. No cardiac enlargement, B.P. 170/105. Blood analysis: urea, 165; N.P.N., 133; Ca., 6·7; phos., 7·0. Plasma-proteins: alb., 3·32; glob., 2·53; fibr., 0·31. Wassermann, negative. The patient reported twice weekly for three months, during which time he remained at work on a diet consisting exclusively of fruit. The tendon reflexes were markedly exaggerated, and in view of the low blood calcium he was given full doses of calcium lactate, calcium gluconate, and sufficient bicarbonate of soda to maintain the alkali reserve. By April there was a rapidly increasing hypertension, B.P. 190/110, nitrogen retention increasing, calcium remaining at about 6·0. The patient complained

of occasional cramps in the limbs. In May he was admitted to the wards, retinal hæmorrhages appeared, nitrogen retention steadily increased, and death occurred at the end of June. Vomiting and coma occurred at the terminal period, there was no cardiac failure, convulsions only appeared in the last hour of life. Tendon reflexes were markedly increased throughout his illness. Autopsy showed small sclerotic kidneys.

The *terminal convulsions* of uræmia must also be studied when assessing the importance of calcium changes in nephritis, though it is not suggested that such convulsions are usually or even frequently related to this particular chemical factor. It is well known that such convulsions may occur in cases of primary hypertension without any evidence of renal failure at all, and I subscribe to the doctrine, which has been so lucidly enunciated by Fishberg of New York, that such convulsions may properly be described as "hypertensive encephalopathy." They are essentially an expression of an alteration in the cerebral circulation which accompanies changes in the blood pressure. But, putting this in other terms, is it not thereby implied that such convulsions are in reality a manifestation of cerebral asphyxia, and most probably represent oxygen-shortage in the brain? I suggest that in cases where there is coexisting hypocalcæmia, such asphyxial phenomena will be far more readily produced than in others. The following is an example:—

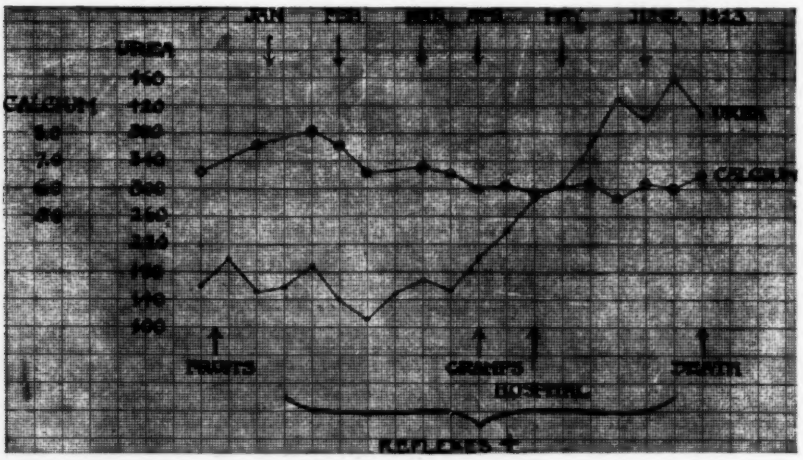

CHART I.—Graph to show progressive renal failure in a patient (E. F.) aged 29. Hypocalcæmia treated by full doses of calcium lactate from outset.

U. V., male, aged 11, admitted to the neurological ward, Middlesex Hospital, under the care of Dr. D. McAlpine, in April, 1933. In the month prior to admission he had had several attacks of violent convulsions with twitching of the left side of the face and followed by stiffness of the limbs. He had not complained of headache or pain. On admission there was no cardiovascular change except that on some occasions the blood pressure, which was closely observed almost hour by hour, was definitely somewhat elevated for a boy of 11; at such times the diastolic pressure was 100 and the systolic as high as 160. At other times the diastolic was 95 and systolic 130. The tendon reflexes were exaggerated, Chvostek's sign was positive, and there was a heavy cloud of albumin in the urine. Lumbar puncture showed the cerebro-spinal fluid to be under pressure; its chemistry and cytology were normal. There was definite bilateral papillœdema. Blood examination showed urea, 400–500; N.P.N., 220–260; phosphates, 9·6; calcium, 4·8. The patient remained in a state of latent tetany with occasional violent convulsions, vomiting, and epistaxis. After four days he died and was found at autopsy to have a large right-sided hydronephrosis with extreme atrophy of the left kidney.

It will be noted that in the above case latent tetany was present. In previous communications I have already emphasised the analogy between this condition and uræmia. Peters is of opinion that the occurrence of frank tetany in renal disease is probably always associated with severe alterations in the alkali reserve, particularly with alkalosis. This conclusion may very likely prove to be correct, but it is probable that marked hypocalcæmia, a direct result of renal insufficiency, is the invariable precursor of the actual occurrence of tetany.

It does not seem possible to escape from the conclusion that the hypocalcæmia of renal insufficiency is often responsible for an increased irritability of the central nervous system, and that such symptoms as muscular twitchings, muscular cramps, convulsions, and occasionally tetany are outstanding clinical manifestations due to this chemical change.

RENAL RICKETS, RENAL DWARFISM, AND RENAL INFANTILISM

But if we wish to see the most dramatic effects of calcium disturbance in nephritis we must look amongst subjects suffering from chronic renal insufficiency and also in such circumstances that disturbance of calcium metabolism will naturally tend to become apparent. Such conditions are essentially met with if we study children, still in the growing period, and suffering from chronic nephritis.

In 1883 a British physician, R. C. Lucas, first described the association of adolescent rickets with albuminuria. The occasional association of nephritis in children with growth defects was noted by various observers in subsequent years, but the full recognition of the condition was made by Morley Fletcher in 1911. Since then the subject has received considerable attention, particularly in England and in America, the principal writings on the subject being those of Parsons, Barber, Paterson, Mitchell, and Ellis and Evans.

Three types of disturbance of bodily development with renal defects occur, either separately or associated with one another. These are renal dwarfism, renal infantilism, and renal rickets. Taking them as one group it is found that the condition is of fairly frequent occurrence in England. Ellis and Evans have collected 20 cases from the London Hospital; Barber in 1926 collected a series of 17 cases and has since made observations on several more; over 80 cases have been published in the literature, and the writer, without making special search to collect cases, has observed more than 12 during the last five years. At the Middlesex Hospital, London, I have been able to make full observations on some of these cases, but many more have been seen at the Royal National Orthopædic Hospital.

It is not my purpose here to give any full description of the clinical manifestations of renal rickets

beyond pointing out that the bony changes may come under observation quite early in life during the first decade, but are still more often seen in adolescence, so that it has come to be recognised, in London and the country immediately surrounding it, that chronic renal disease is probably the commonest cause of that somewhat rare condition, adolescent rickets. In certain cases the bony deformities may be very conspicuous, but usually the case is observed merely as one of severe genu valgum. In others, infantilism, or dwarfism, without marked deformity of the bones, may be more conspicuous. Such cases rarely survive beyond the age of 20, renal insufficiency becoming gradually more severe and terminating in uræmia. Notable clinical facts are that hypertension is usually absent, and there is frequently no evidence as to the ætiology of the renal lesion. In cases where rickets is conspicuous the X ray appearances of the bones are characteristic, and radiologists with special experience in this class of work are often able to diagnose the condition by X ray examination alone.

The morbid anatomy presents great difficulties. The kidneys are invariably sclerosed, with considerable increase in the interstitial tissue and destruction of the glomeruli, but lack many of the characteristic features of chronic nephritis of infectious origin. There is usually no history to explain the onset of the disease. In a few cases the patient has been the victim of an acute streptococcal nephritis following scarlet fever or other infectious diseases; Brockman, Cockayne, and Lee Lander have described cases of this type, and one has been under my care in the Middlesex Hospital for a long time, particulars of this latter being as follows:—

W. X., female, aged 19½. At the age of four had scarlet fever with nephritis definitely diagnosed in fever hospital. Health fairly good until age of 11 when marked genu

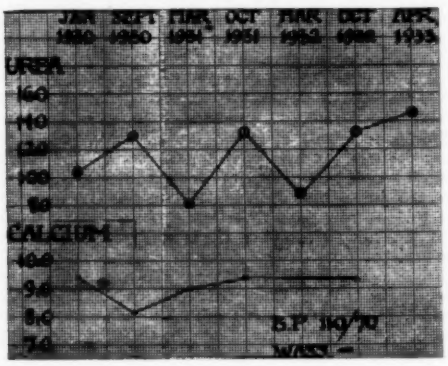

CHART II.—Case of renal dwarfism in a patient (W. X.), aged 19½, following nephritis in infancy

valgum developed. No œdema. Normal cardiovascular system. Constant slight albuminuria. Retinæ normal. Treated with full doses of calcium lactate and cod-liver oil, and legs straightened by callipers; she is now, at the age of 19½, very well and working in a shop; she trained to become a ballet dancer, but abandoned this ambition on account of parental objections.

It must, however, be accepted that nephritis of infective origin is seldom demonstrable as the cause of this condition; Mitchell, in an exhaustive inquiry into chronic nephritis in childhood, found only two examples with such an ætiology.

COMMENTARY

I would, however, conclude this paper by directing attention to certain recent observations which suggest that this problem of the ætiology of chronic nephritis in children may become less obscure as the result of future research; in Queensland it has been observed by Croll and Nye that chronic nephritis occurs amongst children with greater frequency than in any other part of Australia, and probably than in almost any other part of the world. These investigators have made close study of a large series of children, usually adolescents with general debility, pallid and wizened features, stunted physical development, and very marked hypertension. Retinitis is a frequent occurrence amongst them, and uræmia or hypertensive disasters usually terminate their existence before adult life is reached. Biochemical investigation reveals marked renal insufficiency. In their search for the explanation of this curious state the Australian doctors noticed that another condition was also very prevalent in Queensland amongst children—namely, lead poisoning. Until recent years a number of children were admitted annually to the hospitals of Queensland suffering from neuritis, gastro-intestinal disturbances, and the other classical manifestations of plumbism. The explanation is a curious one; Queensland is a very hot country where rain occurs very seldom, and the people inhabit painted wooden houses surrounded by verandahs. Owing to the heat the paint dries and crumbles, and when on rare occasions there is a fall of rain, the children, delighted by this unusual spectacle, run out and lick the raindrops off the pillars of the verandahs. The result is lead poisoning. During his investigation into the cause of chronic nephritis in children, Nye noted that nearly all the subjects whom he observed had been nail-biters during early childhood, and had inhabited wooden houses with verandahs such as I have described. Their condition was exactly that seen as the late result of lead poisoning. He proceeded to investigate a series of children, not complaining of any disease, but who had been known to have suffered from lead poisoning some years previously. He found that in every single case such children had marked hypertension, slight albuminuria, and biochemical proof of advancing renal insufficiency.

I bring this matter to notice not with the suggestion that it offers a clue to the ætiology of renal rickets in England, because hypertension, which is very marked in lead poisoning and in the Queensland cases, is practically never seen in renal dwarfism in Great Britain; but the Australian observations are important as an illustration of how an unsuspected factor may produce chronic nephritis almost in epidemic proportions.

The other recent observations which seem specially important are those of Ellis and Evans. Investigating a large series of renal dwarfs at the London Hospital, these observers noted that in the post-mortem records of past cases, and in post-mortems made on cases under their own observation, dilatation of the urinary tract was often prominent. Urinary retention appeared to occur from the level of the urethro-vesical sphincter upwards. No obvious lesion could be demonstrated in this region, and a disorder of the neuromuscular mechanism is suggested as an explanation. In further support of their hypothesis they produced evidence of dilatation of the ureters and of the pelvis of the kidneys in several cases during life. Here again we have another possible explanation of a condition in which the ætiology is still obscure.

In conclusion, it may be said that although the origin of renal rickets remains obscure, and although the causation of hypocalcæmia in all cases of renal

insufficiency is still somewhat of a mystery, we cannot ignore the importance of this hypocalcæmia, and it seems probable that it is responsible for certain striking symptoms and physical changes to be observed in chronic nephritis both in children or in adults.

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EXPERIMENTS ON THE ALLEGED CANCER-PRODUCING QUALITIES OF TOMATOES

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THE tendency to seek an ætiological factor responsible for cancer formation amongst the organic and inorganic constituents of human and animal food or amongst the various impurities which may be found in such foodstuffs is not new. Many food products of the most various kinds have been incriminated. This fact alone renders it a priori extremely improbable that, generally speaking, any particular foodstuff in itself should play any part at all in the causation of cancer. But it must be conceded that two elements connected with food may perhaps have a contributory rôle:

1. The contamination with certain parasites of an animal or vegetable nature (this in view of the frequency of certain animal cancers when particular parasites are present).

2. The varying constitution of certain foodstuffs, this variation being, partly at least, associated with varying soil constituents. Thus several workers (mostly French) have tried to relate a frequent occurrence of cancer with a mineral imbalance of the soil (magnesium-calcium-potassium). A diminution of the magnesium content of soil and vegetables, automatically followed by an increase in potassium, is said to stimulate cancer formation, whilst a soil (and vegetables) rich in magnesium and concomitantly poor in potassium—such as is found, for example, in Egypt—is said to be unfavourable for cancer formation. To what extent these assertions are justified will probably be shown by extensive research work and scientifically satisfactory statistics.

Tomatoes (which had already been incriminated) have recently been found by Bellows and by Askanazy (in Geneva) to have the property of causing a rapid development of peritoneal sarcoma in a very high percentage of white rats. These animals were injected intraperitoneally with tomato juice or with killed cultures of a *subtilis*-like bacillus which had been obtained from the interior of tomatoes. Sarcoma of the peritoneum was even produced by giving tomato juice per os with the ordinary food. The picture produced by this treatment with tomato juice or by the bacillus just referred to was that of an extensive sarcomatosis of the peritoneum, the latter being covered with innumerable tumour nodules varying in size from a pinhead to that of a small apple (weight 30 g.); no real metastases were, however, formed. Both the description and the photographs produced seem to make it certain that these tumours (which could be grafted into new animals) were true sarcomas.

In view of the importance of the subject it was thought that far-off South Africa with its local tomatoes would be a suitable country to initiate control experiments. With one exception, where a *subtilis*-like organism was obtained from a tomato, all the tomatoes used were found to be bacteriologically sterile internally.

Twenty-eight white rats and 78 white or piebald mice were used for the experiments.

RATS

In a first series 8 rats were injected every third day intraperitoneally with 4 c.cm. tomato juice each, until every rat had received ten injections. After a rest of seven weeks (no tumour or "resistance" of any kind being felt) six more injections were given to each animal, with weekly intervals. Apart from one rat which died from peritonitis the animals remained healthy and did not develop tumours.

In a second series 4 rats received a mixture of tomato juice and siliceous earth intraperitoneally. Small granulomas formed around the injected material, but after three months no sarcoma had developed. The rats then received six more injections, of tomato juice only, at weekly intervals. Three months after the last injection no rat had developed a tumour.

In a third series 2 rats received intraperitoneally killed cultures of the *subtilis*-like organism which had been obtained from one of the tomatoes. Eight injections were given, with intervals of three or four days. No sarcoma developed; after a rest of seven weeks another series of three injections was given, at weekly intervals, consisting of tomato juice plus living cultures of the *subtilis*-like organism. A few days after the third injection both rats died of general peritonitis; there was no trace of tumour formation.

Another series of 2 rats was given *subtilis*-emulsion plus siliceous earth (one intraperitoneal injection per animal). Though the same emulsion was used as in the first injections administered to the rats of the previous batch (which injections apparently did no harm to the animals), the adding of siliceous earth altered the conditions, and both rats were found dead on the day following the injection.

Another 2 rats were given single intraperitoneal injections of rat embryo pulp. Nothing developed, not even a palpable teratoma.

Another 2 rats were injected once intraperitoneally with rat embryo pulp plus siliceous earth; only small granulomas formed. Four other rats were injected once intraperitoneally with rat embryo pulp plus siliceous earth plus tomato juice. Here, again, siliceous nodules only formed in the abdomen.

Finally 4 rats received single intraperitoneal injections of rat embryo pulp plus siliceous earth plus tomato juice plus *subtilis*-emulsion (obtained from a tomato). Here, again, only granulomas formed.

MICE

Intraperitoneal injections were made into 38 mice as follows: Two with 0·5 c.cm. each of siliceous earth in saline suspension. Two with 0·5 c.cm. each of *subtilis*-

emulsion in saline. Two with 0·5 c.cm. each of siliceous-earth suspension plus 0·5 c.cm. of *subtilis*-emulsion. Two with 0·25 c.cm. each of siliceous-earth suspension plus 0·25 c.cm. of *subtilis*-emulsion. Ten with 0·5 c.cm. each of tomato juice. These injections were repeated four times (at four-day intervals). Ten with 0·5 c.cm. each of tomato juice plus siliceous-earth suspension (once only). Ten with 0·5 c.cm. of tomato juice plus siliceous-earth suspension plus *subtilis*-emulsion (once only).

Most of these mice died, apparently as a consequence of the treatment. Nine survived for three months; none had formed a tumour.

Forty mice were inoculated partly intradermally and partly subcutaneously in the dorsal region, and otherwise treated as follows:—

Ten mice received injections of 0·5 c.cm. tomato juice. These injections were given every three to four days for eight weeks, 17 injections being given in all; then, after a rest of three weeks, another series of 8 injections was given at weekly intervals. Three months after the cessation of treatment none of the surviving mice had any tumour; some had had abscesses.

Ten mice received injections of 0·5 c.cm. tomato juice plus *subtilis*-emulsion (bacilli killed, spores alive). These injections were given and repeated in exactly the same way as in the previous batch of ten mice, which received tomato juice only. Three months after the last injection no mouse had a tumour. They all had local abscesses.

Ten mice were injected with tomato juice only, but immediately afterwards they were painted with English tar in the same region on a surface of approximately 1 cm. square. This combined treatment was given twice a week for a period of eight weeks. Then, as several mice had died and the surviving ones had numerous abscesses in their skins and subcutaneous tissues, they were only painted with tar, no injections being given for four weeks. The painting was done twice a week. During a subsequent period of two months the mice were again injected with tomato juice into the skin of the back, but once a week only, whilst they were painted twice a week with tar. During that period papillomas made their appearance. Three months after cessation of treatment four mice survived. They had papillomas, but no epitheliomas; whilst several mice in former experiments, not described here, which had received tar treatment but without tomato juice, had at that time definite epitheliomas.

Finally, ten mice were injected with tomato juice plus *subtilis*-emulsion and then painted with tar as in the previous batch. The mode of injections and painting was exactly the same as described for the previous batch. At the end of the treatment three mice were left; they had papillomas; one of them was developing an epithelioma. But, as already stated, control mice which had received ordinary tar painting only also showed epitheliomas.

From these experiments it can well be concluded that neither the tomato juice nor *subtilis*-culture products caused tumour formation in rats or mice, and that, in combination with tar painting, tomato juice and *subtilis* did not hasten the formation of tar cancer in mice.

These negative results have been confirmed by other control investigators (Collier and Jaffe, Fischl and Kussat, Larionow, Pawlowa, and Schabad). Curiously enough, Askanazy himself subsequently reported that, while continuing his tomato experiments, he could obtain no further positive results in his white rats. His positive results had been obtained mostly with African tomatoes, while in the subsequent negative experiments European tomatoes were used. Askanazy can offer no explanation for the change in results.

Taken as a whole, our and other workers' negative results, as well as Bellows's and Askanazy's positive results, suggest that the presence or absence of an inherent constitutional factor in the experimental animals is of paramount importance. If this factor is present, it is easy enough to produce true tumours by means of any chronic irritation of adequate severity and duration; but if this factor is absent, unspecific irritations, like that caused by tomato juice injections, elicit no true neoplastic response.

SUMMARY

Askanazy and Bellows's successful production of peritoneal sarcoma in rats by means of tomato juice injections could not be repeated. Neither in rats nor in mice did a single case of sarcoma occur; nor did the sub- or intra-cutaneous tomato juice injections into mice, when added to tarring, hasten the formation of skin tumours.

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THE TREATMENT OF PULMONARY TUBERCULOSIS BY GOLD

A RECORD OF FIFTY CASES

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" Surely there is . . . a place for gold " (Job xxviii. 1).

THERE is still some doubt about the value of gold treatment in pulmonary tuberculosis. Whilst such observers as Gravesen [1] and Stub-Christensen [2] are convinced that it is very useful in suitable cases, others remain either sceptical or definitely opposed to its use.[3] Hence it seems that the publication of further records is desirable. The following series of 50 cases was taken from men patients at the Royal National Hospital for Consumption, Ventnor.

Adopting the L.C.C. classification, 1 (2 per cent.) belonged to Class A (T.B.−). The rest came into Class B (T.B.+), and consisted of 3 (6 per cent.) belonging to Group I., 28 (56 per cent.) to Group II., and 18 (36 per cent.) to Group III. For purposes of comparison 50 consecutive cases treated without gold are also considered. These latter were, on the whole, patients with a slightly more favourable prognosis than the former; 9 (18 per cent.) of them belonged to Class A, and of the remainder (Class B) 2 (4 per cent.) belonged to Group I., 30 (60 per cent.) to Group II., and 9 (18 per cent.) to Group III. Only one patient treated with gold had an artificial pneumothorax, whereas 20 of those untreated with gold had some form of collapse therapy.

The gold injections were begun for a variety of reasons: large amounts of sputum remaining "T.B. positive"; failure to improve, or insufficient improvement, under ordinary sanatorium régime; or acute spread of the disease. The selected case was first tested for the presence of albuminuria, and if this was absent the intravenous injections were commenced. The first dose given was very small (usually 0·025 g.), and at weekly intervals the injections were continued unless complications ensued. The usual course with Sanocrysin and Crisalbine consisted of 0·025 g. twice, 0·05 g., 0·1 g. twice, 0·25 g. twice, 0·5 g. twice, 0·75 g. twice, and 1 g. twice, making a total of 5·3 g. Ten of the cases received sanocrysin and 38 crisalbine. The remaining 2 were given Solganal in total doses of 1·85 and 1·9 g. respectively. If the general condition of the patient was sufficiently good, he was allowed to continue ordinary sanatorium exercise or work during the course and was only confined to bed for the remainder of the day after each injection. The urine was tested after each dose, and the patient

instructed to report at once if he noticed any rash or sore-throat. In this way, as far as possible, complications were noted as soon as they occurred.

RESULTS OF TREATMENT

The results obtained are shown in Table I. The figures refer to the number of cases. The data

TABLE I.—*Results of Treatment*

	Number and percentage of—	
	Cases treated with gold.	Cases not treated with gold.
Sputum increased	4 (8)	7 (14)
„ unaltered	14 (28)	24 (48)
„ diminished	25 (50) } (64)	16 (32) } (38)
„ disappeared	7 (14) }	3 (6) }
Sputum showing increase in T.B.	2 (4)	1 (2)
„ becoming T.B. positive	3 (6)	3 (6)
„ remaining T.B. „	18 (36)	18 (36)
„ showing decrease in T.B.	5 (10) }	3 (6) }
„ becoming T.B. negative	18 (36) } (46)	10 (20) } (26)
„ always T.B. negative	4 (8)	15 (30)
General condition worse	6 (12)	4 (8)
„ „ improved	44 (88)	46 (92)
Temperature increasing	5 (10)	3 (6)
„ decreasing	26 (52)	18 (36)
„ normal throughout	19 (38)	29 (58)
Weight less	7 (14)	7 (14)
„ increased	43 (86)	43 (86)

suggest that the administration of gold diminishes the amount of sputum and tends to bring about the disappearance of tubercle bacilli. Since the cases treated by gold were, on the whole, poorer material (if one may use the phrase) than those untreated, it appears that the general condition of the patient is also more benefited by this form of treatment than without it.

More favourable results were obtained in those uncomplicated cases in which larger doses could be given (Table II.). Where, as a result of some complication, the treatment had to be abandoned before a total of 1 g. had been administered, the results were not so good. The following figures, expressed in percentages, show the difference in results obtained in 10 cases receiving less than 1·0 g., and 30 cases receiving more than 2·5 g. of crisalbine or sanocrysin. Complications appeared after very small doses as well as after larger amounts. There was no marked difference between the results obtained with sanocrysin and those with crisalbine.

TABLE II.—*Results of Larger Doses*

	Percentage of cases receiving—	
	Less than 1·0 g.	More than 2·5 g.
Sputum diminished	50	60
„ becoming T.B. negative	20	50
General condition improved	60	96

The cases which responded best to the treatment were those belonging to Groups B I. and II.; 96 per cent. of these improved in their general condition and in over 50 per cent. the sputum became negative. Improvement was specially marked in those cases in which a recent subacute spread of the disease had occurred. Group III. cases, with extensive bilateral disease and excavation, did not react so favourably, as only 72 per cent. of these showed improvement in the general condition and in only 15 per cent. was the sputum rendered negative. Six Group III. cases with severe toxæmia, which showed no sign of improvement under routine treatment, received gold. Five out of the six patients were definitely worse after the treatment. In one case an acute exacerbation of the disease followed the administration of only 0·025 g.

COMPLICATIONS

Complications following the administration of the drug were noted in 70 per cent. of patients undergoing treatment. Although in the majority of cases the symptoms were extremely mild (such as slight fever, slight malaise, or rather vague so-called "rheumatism"), in a few patients more severe reactions were noticed. Table III. shows the complications which occurred in this series, and the number of cases affected.

TABLE III.—*Complications*

Fever	10 (20 per cent.)	—
Rash	10 (20 per cent.)	Occurred after only 0·25 g. as well as after larger doses (e.g., 5·3 g.).
Stomatitis	6 (12 per cent.)	All six cases had over 2·5 g. One developed a mild attack of parotitis.
Malaise and metallic taste	6 (12 per cent.)	—
"Rheumatism"	6 (12 per cent.)	An attack of gout in a patient subject to this complaint occurred after 0·1 g. No further attacks were seen for the rest of the course.
Gastro-intestinal symptoms	3 (6 per cent.)	Transient vomiting and/or diarrhœa.
Albuminuria	2 (4 per cent.)	Both patients had over 2·5 g.
Nerve lesions	2 (4 per cent.)	Sciatica and Bell's palsy.
Syncope	2 (4 per cent.)	Both patients had solganal.
Purpura	1 (2 per cent.)	—
Jaundice	1 (2 per cent.)	—

The rash usually took the form of a slight, itching, papular eruption appearing especially on the arms and face, and disappearing within about a week if the drug was immediately discontinued. In certain cases the intravenous injection of Ametox (sodium thiosulphate), in doses of 0·6 g., repeated at intervals of a day or two, definitely relieved the itching (and indeed may be of benefit in other complications). It is interesting to note that in this series a skin rash and a stomatitis were never seen together. In one patient the rash developed into an acute exfoliative dermatitis, and was accompanied by such unusual symptoms as to merit special mention.

This patient had extensive bilateral lung disease and a tuberculous larynx. Under ordinary sanatorium treatment his general condition had improved, but he still had a considerable amount of T.B. positive sputum. A course of sanocrysin was accordingly started. After a total of only ½ g. had been given, a rash was noticed which rapidly developed into an acute exfoliative dermatitis involving the whole body. This was followed by the appearance of widespread petechiæ, epistaxis, and profuse hæmaturia lasting for about a week. Fever and leucocytosis were accompanied by marked deterioration in the general condition. As the dermatitis improved the patient suffered from a mild attack of multiple furunculosis. The onset of a Bell's palsy and an attack of sciatica further complicated the already complex clinical picture. Finally the patient's general condition improved somewhat, the skin healed, the urine showed no abnormality, and the sputum diminished in amount and became T.B. negative.

An unusual feature of this series was the infrequency of urinary complications. Apart from the case of hæmaturia, only two patients showed an abnormality in the form of a mild albuminuria. This result is in marked contrast to the experience of many observers. The onset of jaundice after the administra-

tion of 0·8 g. of crisalbine was noted. The attack was a mild one and with the administration of glucose and ametox (1·8 g.) all trace of icterus had disappeared within five weeks of the onset.

An alarming complication occurred with solganal. Only two patients received this drug, but in both cases the injection of the final dose (1 g.) was almost immediately followed by nausea, sweating, and syncope. After this experience with the first patient, the administration to the second was preceded by glucose, and the drug was injected very slowly into the vein. But again syncope followed. The patients soon recovered from these transient but alarming symptoms, and indeed appeared to have benefited from the course, as evidenced by their general improvement and a disappearance of bacilli from the sputa.

CONCLUSIONS

It would obviously be unwise, from an experience of only 50 cases, to draw dogmatic conclusions as to the value of gold treatment, more especially because only the immediate results can be considered. But the present series appears to confirm the generally accepted view that gold treatment has at any rate a temporary beneficial effect in selected cases of pulmonary tuberculosis, being especially useful in rendering the sputum T.B. negative and diminishing its amount. There appears to be a simultaneous improvement in the general condition of the patient. Moreover the psychological effect on certain individuals of an additional form of treatment to ordinary sanatorium régime is quite convincing, and is of definite benefit to the patient.

The fact that complications (even though mostly of a mild nature) occurred in 70 per cent. of patients shows the necessity for close supervision of the cases. The infrequency of urinary abnormalities in this series is noted, and the possible value of ametox in treating various complications suggested.

I am indebted to Dr. G. Oliver Hempson, medical superintendent of the Royal National Hospital, for kind permission to publish these cases.

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CONGENITAL UMBILICAL HERNIA

REPORT OF A CASE OF AMNIOTIC HERNIA

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IN April, 1930, a primipara, aged 31, was admitted to the Queen's Hospital, Birmingham, and gave birth to a male child. The confinement was normal.

The infant's abdominal wall had failed to develop, and the abdominal contents, protruding as a large hernia, were visible through a transparent covering, which moved over them with the infant's respirations. The deficiency extended from within one inch of the symphysis pubis almost to the xiphisternum; the hernia was about the size of the child's head, and through its transparent wall the liver and the large and small intestine were clearly visible. It appeared to contain the whole of the abdominal viscera, as the abdomen itself seemed quite empty, and the abdominal wall on either side of the opening was flattened and somewhat lax. The skin of the abdominal wall extended for a short distance up the sides of the sac. Unfortunately, the urgency of the condition made it impossible to photograph the infant at the time. The accompanying reproduction of a photograph of a similar case, reported by Dr. Wellington Yates of Detroit,[1] gives a very fair idea of the condition (Fig. 1).

I first saw the infant about two hours after delivery, and as it appeared to be otherwise healthy, arrangements were made for immediate operation. This was begun two hours and fifty-five minutes after the birth of the child, under gas-and-oxygen anæsthesia. The sac, which was

FIG. 1.—An amniotic hernia illustrated in Prof. T. S. Cullen's "Embryology, Anatomy and Diseases of the Umbilicus." Reproduced by permission of the publishers, Messrs. W. B. Saunders Co., Ltd., Philadelphia and London.

composed of fused amnion and peritoneum, was rapidly removed from below upwards, together with a very narrow strip of skin and aponeurosis, in the hope that the layers of the abdominal wall would be distinguished, so that an efficient repair by suturing each separately could be carried out. Peritoneum, aponeurosis, and skin, however, were fused together, and the inner edges of the recti muscles were not seen. As speed and a minimum of handling were essential, and as it was undesirable to sacrifice more tissue than was absolutely necessary, no attempt at dissection was made. It was seen that the whole of the small intestine, the cæcum, the ascending, transverse, and part of the descending colon, the liver, the greater curvature of the stomach, and the spleen were outside the abdomen. As the sac was removed the intestines were controlled and gently compressed backwards into the abdomen by my assistant; to facilitate their retention within the abdominal cavity the edges of the lower half of the deficiency were at once approximated, without much difficulty, by through-and-through silkworm-gut sutures. No difficulty, of course, was experienced in placing the stomach and spleen in the abdomen; the transverse diameter of the liver, however, far exceeded the width of the opening, the margins of which could not be retracted sufficiently to allow of its "reduction," on account of the rigidity of the lower ribs. This difficulty was overcome by partially emptying the liver of its contained blood by gentle uniform pressure with a moist gauze pad, its size thus being sufficiently reduced to allow it to be guided through the opening into the abdomen. This manœuvre did not appear to have any ill-effect on the child. The remainder of the opening was then closed in the same way, and the wound was supported by strapping carried right round the abdomen.

The whole operation was completed in 23 minutes. The infant stood it remarkably well. Ten c.cm. of normal saline were injected into each axilla, and breast-feeding was commenced as soon as possible. The wound healed by first intention; alternate sutures were removed on the twelfth day, and the remainder five days later.

The child left hospital at the age of one month, and has progressed well ever since. He is now three and a half years old, and is healthy and normal in every respect, apart from his abdominal wall being formed of dense fibrous tissue over

an area measuring 3½ inches by 2½ inches (Fig. 2). The scar, which is firm and healthy, occupies the space left by the divarication of the recti abdominis muscles; its upper half is a little less firm than the lower, but the maximum protrusion beyond the surrounding level of the abdomen is only about half an inch, and the abdominal contents are controlled in a perfectly satisfactory manner. The recti muscles encircle the hernia on both sides, and are a little less well developed than normal, but their tone is good. There is slight but definite bulging of the scar on straining, but less than there was a year ago. For the first 12 or 18 months the scar gradually increased in width, but since then it has remained the same size; its length has not altered from the first. A belt with a pad was worn for the first year, but this is no longer necessary, and considerable difficulty was experienced in keeping it in position.

FIG. 2.—Photograph showing the abdominal scar at 3½ years of age.

In view of the decrease in the relative size of the hernia, and the absence of any disability, no operative interference is contemplated. Moreover, when the child was a few months old, it could be seen that the intestines were adherent to the under surface of the scar, so that any dissection would be fraught with considerable danger, possibly entailing the resection of portions of small intestine. It is also doubtful whether any attempted repair would result in a stronger abdominal wall than he has at present.

Two types of umbilical hernia, or exomphalos, may be present in the new-born infant. Cullen [1] describes them under the headings (1) hernia into the umbilical cord, and (2) amniotic hernia.

HERNIA INTO THE UMBILICAL CORD

The terms "hernia into the umbilical cord" or, as it is alternatively called, "true congenital umbilical hernia," are inaccurate, as it is *not* a true hernia, the contents never having been inside the abdomen. By far the greater part of the intestine is developed outside the abdominal cavity, in the umbilical sac, which is part of the extra-embryonic cœlom, and lies in the proximal part of the umbilical cord. At first it forms a single loop—the umbilical or U-loop—to the apex of which is attached the vitello-intestinal duct, the allantois lying on its caudal aspect. Normally the intestine enters the abdomen at the third month, the extra-embryonic cœlom disappears, and the umbilical ring closes. The vitello-intestinal duct has separated from the apex of the loop some time previously, and the intra-abdominal portion of the allantois remains as the urachus.

In certain cases the extra-embryonic cœlom persists, and may retain within its cavity a greater or lesser part of the intestine, resulting in the so-called hernia of the umbilical cord, or true congenital umbilical hernia. This manifests itself as a swelling at the fœtal end of the umbilical cord, whose walls, composed of amnion and peritoneum, are very thin, so that the intestinal loops within the sac are readily visible. The diameter of the widest part of the swelling exceeds that of the umbilical opening, which exhibits a real ring formation. The umbilical vessels are spread out on the side of the "sac," from the deep surface of which adhesions may pass to the coils of intestine contained therein. The remnants of the vitello-intestinal duct may pass from the intestine to the distal end of the "sac," and in some cases a patent urachus is said to be present in its wall.[2]

Many such cases have been reported, notably by Sheen,[3] who described a case in which there was a hernial protrusion into the cord forming a mass the size of a hen's egg, due to the presence of large and small intestine, and by D'Arcy Power,[4] in whose case about a foot of small intestine was present in a fusiform swelling of the cord near the abdomen. According to Milch [5] this condition occurs in 1 in 5000 to 6000 births, and is more common in males than females. Meszáros [6] prefers the term "cœloma funiculi umbilicalis persistens," and is of the opinion that the condition is due to disproportion of the maternal pelvis, with a consequent increase in the curvature of the back of the fœtus, thus preventing the extension of the abdominal cavity in the sagittal direction. As a result of the closure of the muscles of the abdominal wall, the abdominal organs developing in the extra-embryonic cœlom are excluded from the abdominal cavity.

AMNIOTIC HERNIA

In 1881 Nicaise [7] referred to the *amniotic umbilicus*, which is characterised by the absence of skin and muscles around the umbilicus, the defect being replaced by amnion, which is reflected upon the abdomen from the umbilical cord. The surrounding muscles are usually intact. The absence of the abdominal wall at this point results from a failure of cleavage of the epidermal and mesodermal structures in the midline—i.e., non-formation of the fœtal linea alba. The deficiency is represented by amnion and peritoneum, usually fused, and in rare instances it may be very large, with wide separation of the recti muscles. Such a case is reported by Carrington Williams [8] who describes a case of a negro child, seen two days after birth, in which there was a deficiency of the abdominal wall about three inches in diameter. The coils of intestine could be seen through the thin transparent membrane covering them, but there was no protrusion of the abdominal contents.

Intra-abdominal pressure tends to produce a hernial protrusion, especially if the abdominal wall is deficient over a wide area, resulting in the formation of an *amniotic hernia*. Such was the case I have described, and a very similar one was reported by Hipsley,[9] in which the hernia was the size of the fœtal head, and the measurements of the opening four and a half inches by two inches. In his case, the ligaments of the liver were attached to the interior of the sac, and had to be divided when this was removed. Such cases may be regarded as true herniæ, as part—i.e., liver, stomach, and spleen—if not all of their contents must have been developed inside the intra-embryonic cœlom, to be herniated later through the membrane covering the deficiency. That such protrusion can occur is proved by the case mentioned above, in which there was a large deficiency, but no protrusion, and by one described in a personal communication to Cullen [1] by Dr. S. E. Sanderson, who saw a newly born infant in whom the anterior abdominal wall had failed to develop over a wide area; when he saw it, it was three days old, and intra-abdominal pressure had already produced a marked protrusion, which was steadily increasing in size.

Fraser,[2] however, states that an error in closure of the fœtal linea alba accompanies a marked degree

of persistence of the extra-embryonic cœlom, with retention within its cavity of coils of intestine. If this is so, large amniotic herniæ, containing viscera other than intestine or considerable lengths of intestine, may well be the result of a combination of these two developmental errors; the contained intestine remaining in the cavity in which it develops, and such organs as the liver, stomach, and spleen, which develop within the abdomen, and perhaps part of the intestine, being pushed forwards by intra-abdominal pressure, thus enlarging the opening that is already present. In such a case this origin could only be established if one were to observe that the rotation of the intestinal loop had been arrested, or were able to recognise the attachment of the vitello-intestinal duct.

TREATMENT

The treatment of all cases of congenital umbilical hernia, and of amniotic hernia, is by immediate operation. It is surprising how well a new-born child stands what is essentially a severe operation. The procedure must be adapted to the condition present; the sac is opened and removed, together with a narrow strip of the margin of the opening in the abdominal wall. If any adhesions or a persistent vitello-intestinal duct prevent the removal of the sac from its contents, they must be divided. The possibility of the presence of a patent urachus must be borne in mind. After reduction of the contents of the sac, aided, if necessary, in the congenital type of hernia by enlargement of the umbilical opening, the abdominal defect is closed. Hipsley, in one of the two cases he reported,[9 10] was able to dissect out and suture the various layers of the abdominal wall; this may not be feasible, and, especially in small herniæ, does not appear to be necessary, through-and-through silkworm-gut sutures being sufficient.

Unless one of the two fatal complications has already occurred, no case should be regarded as hopeless, and operation should be urged. All untreated cases end fatally, and it is uncommon for those with a very large hernia, such as the one described, to survive operation. When operation is deferred for any length of time, the two main dangers are paralytic ileus and infection of the sac wall. In the case reported by Carrington Williams, operation was not undertaken until two days after birth, when the covering membrane had become yellow and opaque, due to the onset of infection. The infant died two days afterwards, and post-mortem examination established the presence of infection; positive cultures were obtained from the peritoneal cavity, the deep surface of the membrane, and the pericardium.

The case may be rendered almost hopeless by injury during delivery, and Hempel-Jorgensen reported two such cases in the same family.[11] An umbilical hernia the size of a cocoa-nut was present in two robust boys born a year apart, of healthy parents. Both infants lived only a short time, for the sacs ruptured during delivery. One of the father's sisters had a child born with a large spina bifida.

I have only been able to find a record of one case in which operation has been undertaken so soon after birth. This was a case of hernia into the umbilical cord described by Reed,[12] in which the cord had ruptured two inches from the umbilicus, so that the bowels had escaped laterally. Conditions were filthy; the child was taken to hospital and operated upon two hours after birth. Recovery was uneventful!

My thanks are due to Mr. E. W. Barnie-Adshead, under whose care the child's mother was admitted, for permission to publish the details of this case.

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SYNCOPAL ATTACKS AS A SYMPTOM OF INTUSSUSCEPTION

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The occurrence of sudden pallor during the attacks of pain in cases of intussusception is observed so frequently that it is perhaps surprising that the possibility of actual syncope is not mentioned in any of the standard text-books. The recent admission to the London Hospital of a case in which attacks of unconsciousness were the presenting symptom provided a diagnostic problem which was only satisfactorily solved when a closely similar case came under observation one month later. The two cases are reported as examples of one cause of syncope during infancy, since not only is syncope an unusual complication of intussusception but is rare from any cause at this age.

Case 1.—A. B., a well-developed and nourished male infant of 9 months, weighing 20¼ lb., was admitted to the children's department of the London Hospital on June 22nd, 1933. He had been breast-fed, with added soft solids for the past month, and had had two normal stools on the day of admission. He had been well until three hours before being brought to hospital, when he suddenly screamed, fell forward in his pram, and appeared "lifeless." The attack lasted several minutes, and similar attacks recurred on the way to hospital. When he was first seen in the receiving room the infant was thought to be moribund. He was unconscious, the face and lips ashen grey, and the respiration and pulse were barely perceptible. There was general flaccidity of the limbs, and the eyes were turned upward. By the time he had reached the ward, the infant had regained consciousness and appeared well and active. He was of good colour, the pulse was strong and not unduly rapid, and he played and cried normally. On examination there appeared to be some general tenderness of the abdomen, but no other abnormality was found. There was no vomiting at this time or subsequently. During the next 24 hours the infant had repeated attacks of unconsciousness, which came on without warning and lasted for several minutes. At these times he would suddenly fall forward or collapse on the pillow, and the face become greyish-blue in colour. There were no convulsive movements, and the limbs were always flaccid when examined. Recovery was rapid. The infant would regain consciousness, usually with a cry, and within a few seconds would be of normal colour and show very little evidence of shock. At 1 P.M. on the day following admission (21 hours after the occurrence of the first attack) the infant passed a copious fluid stool containing much dark blood and mucus, and very little fæcal matter. No tumour could be felt on rectal or abdominal examination at this time.

After two further syncopal attacks the infant was entirely free from symptoms and was discharged home on the fifth day. Since then he has been well, and subsequent stools have been normal. Examination of the melæna stool for pus and pathogenic organisms was negative, and the serum-agglutination reactions were negative for the typhoid-dysentery group of organisms.

CASE 2.—C. D., a well-nourished infant of 16 months, was admitted to the children's department of the London Hospital on July 27th, 1933, with one hour's history of vomiting and attacks of unconsciousness of sudden onset. The bowels had been open normally on the day of admission. The syncopal attacks were almost identical in type with those described in the case of the first infant, but were of shorter duration and very much more frequent. The infant was obviously in considerable pain between the attacks. He would crawl around the cot moaning, and would suddenly fall forward, his face becoming greyish-white and the pulse barely palpable. Vomiting was frequent, and not even fluid was retained. On examination the pulse-rate was 144, the temperature 98° F. (rising to 102° F.), and the respiratory rate 50. The abdomen was palpated repeatedly and showed some general rigidity, but no tumour could be felt. At 7 P.M. on the day of admission the infant passed a large amount of blood intimately mixed with fæces. Rectal examination was negative except for blood on the examining finger. An anæsthetic was given, when a small tumour could be readily palpated lying under the costal margin; there was no appreciable emptiness of the right iliac fossa. A laparotomy was performed by Mr. A. M. A. Moore, who found the appendix much injected, and a small enterocolic intussusception present. Appendicectomy was performed. The enterocolic intussusception was felt to reduce itself under the surgeon's fingers. Further exploration showed the presence of several large mesenteric glands and four small intussusceptions of the small gut, all of which were readily reduced. Recovery was uneventful. Sections of the appendix showed evidence of subacute appendicitis.

It may be said that the occurrence of fainting attacks in the different age-groups of childhood varies inversely with that of convulsions. Thus whilst convulsions from reflex causes are extremely common during the first two years of life and become progressively less frequent up to the time of puberty, the reverse holds good of syncope. It is singularly rare to encounter true syncopal attacks in infancy, whereas these become relatively common as adolescence is approached. The two cases described above are therefore of some interest as exemplifying the rôle that intense pain may play in the causation of syncope in early infancy. The first case presents two additional peculiarities. Not only was there no vomiting, but the condition appears to have reduced itself spontaneously. It may be said that under these circumstances the diagnosis of intussusception must be regarded as not proven, but the association of intense spasmodic abdominal pain with the passage of a melæna stool hardly admits of any other interpretation, except possibly that of recurrent volvulus. With regard to the likelihood of spontaneous reduction, it should be remembered that it is common during the early stage of an intussusception to find the infant entirely comfortable between the attacks of pain, without any tumour being palpable. Apart from those cases in which the stage of "comfort" really represents a condition of shock, it is probable that in certain other instances the periods of freedom from pain are due to the intussusception actually becoming reduced between the waves of peristalsis, until finally the invaginated gut becomes engorged and œdematous, and consequently irreducible. This is borne out by the extreme ease with which small, early intussusceptions may be found to be reduced at operation, and would account for the absence of vomiting in the early stage, when obstruction would be incomplete and temporary. However, no emphasis can be placed on complete remissions of pain as direct evidence of spontaneous reduction, since they undoubtedly occur in cases in which the gut remains invaginated from the onset. The second case, with a more typical history, showed in addition to multiple intussusceptions, an inflammatory condition of the appendix.

I wish to thank Dr. A. G. Maitland-Jones for permission to report these cases, which were admitted under his care.

BRITISH MEDICAL ASSOCIATION

ANNUAL MEETING IN DUBLIN

SECTION OF OTO-RHINO-LARYNGOLOGY

AT the meeting of this section, presided over by Sir ROBERT WOODS (Dublin) on July 28th, Mr. R. SCOTT STEVENSON (London) opened a discussion on the treatment of

Tuberculosis of the Larynx

He referred to the decline in deaths due to respiratory tubercle in England and Wales (from 33,505 in 1921 to 29,658 reported in 1931), whilst the total cases notified at the end of 1931 amounted to 236,758. He pointed out that on Sir StClair Thomson's estimation of infection of the larynx, in an average one out of every three phthisical patients, there would appear the high total of over 78,900 persons in England and Wales afflicted with laryngeal tubercle. In assessing the value of any method of treatment it should be borne in mind that spontaneous cure of the tuberculous larynx was possible; and in comparing groups of cases, the type of case and age of the patient should be considered, since persons of 40 to 55 responded better than those under the age of 40. Artificial pneumothorax, he said, was being more and more used for the treatment of laryngeal tubercle, its only contra-indication being an acute miliary invasion. His own experience of its value had been very striking. Above all, vocal rest and sanatorium régime were most to be relied upon as sheet anchors in treatment. Women responded rather better than men, and in some sanatoria the atmosphere of silence was more readily assented to than in others. The galvano-cautery was used less and less, but in cases of dysphagia it gave relief if applied exactly to the local lesion. Mr. Scott Stevenson had much hesitation in advocating diathermy. With regard to the value of artificial sunlight, he referred to the conflict of opinion between such authorities as Strandberg, of Copenhagen, who was much in favour of its use in his out-patient clinic, and Sir StClair Thomson, who found it of no value for sanatorium patients. The two types of patient were, however, not comparable, and as the result of experience in L.C.C. sanatoria he shared Dr. Heaf's opinion midway between the two extremes. Of other forms of treatment, local sun-baths, as used by Wessely and Miller in America, proved a long and tedious method. There was considerable promise from the use of the Kromayer lamp with laryngeal applicator designed by Dr. W. Beaumont, and applied in some cases at Colindale Sanatorium. Mr. Scott Stevenson referred also to treatment by chaulmoogra oil, and to the good effects recorded by W. C. Fowler by the injection of gold salts. Tracheotomy was seldom called for except for the

relief of stridor and dyspnœa. For dysphagia, insufflation with orthoform and anæsthesin by Leduc's tube was advocated. In 50 per cent. of a large number of cases at Colindale the blocking of the superior laryngeal nerve with alcohol had proved effective. The patient should be treated rather than the larynx, due regard being given to the lung condition, whilst a routine laryngeal examination of all suspected cases of phthisis might afford evidence of infection not revealed by the stethoscope. Whilst it was difficult to assess the various methods of treatment at their true value, in the 230 laryngeal cases under Mr. Scott Stevenson's observation during 1932 the mainstays had been sanatorium régime and vocal rest, supplemented by artificial pneumothorax.

Mr. P. J. KEOGH (Dublin) commented on the risk of laryngitis following sinus or antrum infection in cases of phthisis, allowing access to the tubercle bacillus through the damaged surface epithelium. He emphasised the need for vocal rest and the importance of arranging for an expert laryngologist to be available at every sanatorium, with full coöperation between him and the physician. This was especially necessary in connexion with treatment by artificial pneumothorax, which helped to cure both lung and larynx, whereas attention confined to the latter would not cure lesions in the former. Use of the galvano-cautery limited to the surface of an ulcer was of service, but over-treatment was harmful. He had also found that when directly applied chaulmoogra oil gave relief to pain, but he did not favour either the use of lactic acid or injection of alcohol and crushing of the superior laryngeal nerve as carried out in America. The application of artificial sunlight was not a simple procedure and required more observations before its real value could be assessed.

Mr. H. S. BARWELL (London), speaking of the choice of climate, said that the high altitude of Swiss resorts made them unsuitable for laryngeal cases, which in the early stage might give rise to no symptoms; hence the importance of examining the larynx in every case of phthisis. Treatment should include abstinence from tobacco, and the use of a watery alkaline spray or chloretone, combined with sanatorium régime and absolute silence; the latter need only be insisted on in curable cases. The forced whisper was more harmful than low speech. Local treatment—e.g., lactic acid and formol applications, or the galvano-cautery—should only be considered in patients who had been in a sanatorium for some time under silence. The curettage of tuberculous ulcers of the larynx was advocated for the stimulating effect of tissue reaction and its resulting fibrosis. Removal of the epiglottis had proved successful in relieving discomfort. In the presence of severe dysphagia little relief could be given except by removal of the free edge and part of the swelling, while in milder cases the pain might be relieved by insufflation with orthoform and anæsthesin, or Euphagin. In extensive ulceration alcohol injection into the superior laryngeal nerve was occasionally beneficial. Tracheotomy generally proved harmful, but in exhausting dyspnœa it might give relief. It was well to remember that pulmonary tubercle never improved whilst the larynx was seriously involved.

Dr. F. R. G. HEAF (London), discussing prognosis of tuberculous laryngitis, pointed out the great changes which treatment had effected since the days, 40 years ago, when cure was regarded by leading experts as hopeless. Despite the serious prognosis still given by many clinicians, the patient's usual optimism was a great aid to recovery, provided he followed advice, especially as to vocal rest. The statistics of the common association of laryngeal with advanced pulmonary tuberculosis had given rise to a pessimistic outlook in many cases. But he regarded post-mortem evidence as unreliable, and it did not follow that tuberculous laryngitis determined a fatal issue. He had had patients with combined infection, who had recovered completely from the laryngitis, yet later succumbed to the chronic pulmonary lesion. The prognosis depended on many factors such as the patient's resistance, temperament, symptoms, and habits, as well as on local conditions. With regard to resistance, family and previous history, the rapidity of onset, and the type of lung lesion often gave valuable information, together with that derived from serial blood examinations—thus, a rapid sedimentation-rate, high monocyte count with low lymphocyte and eosinophil counts indicated a poor resistance, and, if these continued, the laryngeal lesion would not improve. The more fibrotic the type of lung lesion, the less active was the laryngeal infection—allowing of a favourable outlook in patients of 40 up to 60 years old, after which age the course was rapidly downhill. Dr. Heaf discussed in detail the types of laryngeal lesion affecting prognosis, classifying them under the four heads: *extrinsic*—very bad, especially up to 35; *intrinsic*—fairly good, and if no dysphagia, reasonably hopeful; *localised*—the majority did very well; *lupoid*—rarely caused symptoms and responded favourably. Among general aspects he laid stress on the importance of temperament as governing prognosis, and the effect of self discipline and control in allowing vocal rest and following out treatment. Strength of will and moral fortitude backed by every encouragement to secure recovery were essential. In regard to the use of tobacco, he said, there seemed no evidence that moderate pipe or cigarette smoking, *without inhaling*, had any effect on the prognosis of tuberculous laryngitis. Concurrent diseases would influence prognosis according to their general effect on the body—improvement was undoubtedly brought about by treatment of defective conditions of the nasal and nasopharyngeal passage. In conclusion Dr. Heaf again emphasised the need for attention to the general condition, particularly as shown by the patient's blood picture.

Dr. J. R. WHEELER (Belfast) said that 14 per cent. of the patients in a tuberculosis hospital had laryngeal infection, and in 99 per cent. of those so affected tubercle bacilli were found in the sputum. The condition occurred chiefly in more advanced pulmonary cases, only 7 per cent. of those with less active phthisis having a laryngeal infection. Prognosis in laryngeal cases was dependent on the response of the lung condition to treatment, either by artificial pneumothorax or thoracoplasty. The laryngitis was aggravated by lesions of the upper respiratory tract, but tended to clear up after the latter had been treated.

Dr. P. J. DEMPSEY (Dublin) said of vocal rest that the forced whisper was harmful, but that the use of the voice for a few minutes at meal times might wisely be allowed for temperamental reasons. The use of lactic acid should be entirely given up owing to the difficulty of its exact application, and trichloracetic acid was preferable for local treatment. Tracheotomy should be reserved only for cases of dyspnœa owing to the risk of septic infection. In phthisical patients or presumed cures, the question of tonsillectomy should only be approached with great caution, as it appeared to have a harmful effect on the lung condition.

Mr. A. D. SHARP (Leeds) referred to the frequent association of tuberculous laryngitis with defects of the nasal passages, such as deflected septum, large turbinates, and poor air entry. Experts differed in their estimation of the effect of artificial sunlight. The galvano-cautery, and, in severe ulceration of the larynx, the local use of lactic acid, had proved efficacious when given under a general anæsthetic, the effect of which need not be harmful.

Mr. J. B. HORGAN (Cork) said that many cases of phthisis with cavity had shown at autopsy either macroscopic or microscopic lesions of the naso-pharynx. Early diagnosis of laryngitis was of supreme importance, as the chances of recovery depended on treatment of the early stage; hence the need for training of students and practitioners in the use of the laryngoscope.

The PRESIDENT said that tuberculous laryngitis was essentially a chronic infection which did not encourage sufficient tissue reaction, resulting in a sort of compromise between invader and the subject of attack. Resentment in the tissues should be excited to allow the chronic infection to become an acute process; such stimulus was afforded by the use of the electric cautery, and other agents were available according to the particular case. The principle of the need for tissue reaction should always be kept in view if treatment was to be successful, quite apart from sanatorium régime and vocal rest. He advocated ordinary X ray treatment for the general condition of laryngitis with subchordal thickening over a large area by a series of exposures five minutes at a time weekly or bi-weekly.

Dr. R. R. TRAIL (Midhurst) quoted a case of recovery following artificial pneumothorax in a patient who had been given up after four months rest in bed. At Midhurst, he said, general light treatment had given good results in a type of case which had not responded to pneumothorax. It was important to avoid following only one line of treatment, for it was the individual patient who needed attention.

Mr. BARWELL stated that the onset of tuberculous laryngitis, while the patient was under sanatorium treatment and after the induction of pneumothorax, afforded a bad prognosis. As a rule the earliest lesion usually occurred near the vocal process. Lactic acid he had found useful in ulceration of the cords. Tracheotomy was advisable only in the presence of marked dyspnœa, and tonsillectomy only if the laryngeal lesion was making no progress.

Mr. R. R. WOODS (Dublin) said that the most that could be done was to help the patient to improve his lung condition, for if this were progressive little could be done to improve the state of the larynx—hence the value of artificial pneumothorax. The prognosis of the laryngeal was exactly that of the pulmonary condition.

Mr. SCOTT STEVENSON, replying, said that the fundamental points were treatment of the patient rather than the larynx, no special measures being relied upon, but such local remedies as best suited particular cases. He had found lactic acid of value for large ulcers of the larynx. Septic tonsils had been removed with good results in most cases, but not under a general anæsthetic, which was liable to be followed by acute miliary dissemination. Attention to nasal cleansing and use of an alkaline nasal douche helped to improve the laryngeal condition. Preventive measures were the most important, especially the laryngeal examination of all pulmonary cases.

Dr. HEAF, in his reply to the points raised on prognosis, emphasised the need for consideration of all the factors in treatment as well as the patient's occupation, age, and blood picture.

Dr. C. D. S. AGASSIZ (London) then read a paper on

TUBERCULOSIS OF THE LARYNX IN CHILDREN

a condition which he described as usually without symptoms. He had not found laryngoscopy more difficult in children than in adults. In a group of 86 girls suffering from pulmonary tubercle, the sputum of 55 had shown tubercle bacilli and 15 had laryngeal tubercle, in all but one of whom tubercle bacilli were found in the sputum. In the entire series of pulmonary cases showing tubercle bacilli, the larynx had been affected in 20 to 25 per cent., but a primary laryngeal lesion was very rare. In the children of 7 to 16 years examined, tuberculous laryngitis was more often found between 11 and 16, and in girls rather than boys. While laryngeal infection was usually more common in cases where the lung lesion was extensive, it might occur with no evidence of marked lung disease and in the absence of tubercle bacilli in the sputum. In seven cases no symptoms had been noticed by parents, but the voice was toneless with slight huskiness and examination showed reddening of the cords and arytenoid deposits. Dysphagia was very rare and never as severe as in adults; at most slight transitory pain on swallowing was complained of. Routine laryngoscopic examination of all children suffering from pulmonary tubercle was well worth while. The prognosis was usually good in children, the laryngeal lesion being only slowly progressive, as in a case quoted where the lesion had shown little advance after four years.

FILM DEMONSTRATION

The session concluded with a film demonstration of the treatment of tuberculosis of the larynx by means of the Kromayer lamp, Model II. with laryngeal applicator as designed by Dr. William Beaumont, and carried out with sunlight treatment at the Camden Town clinic. A case of lupus, involving pharynx, fauces, and larynx, had received direct irradiation of the larynx by ultra-violet rays for three minutes, three times a week, the larynx being treated before the fauces without the necessity of a local anæsthetic.

NEW INVENTIONS

A NEW INHALER CLIP

I HAVE devised a fastener on the "lever-clip principle" for use with all masks of the Schimmelbusch type. This clip can be snapped on in a moment and

cannot possibly release itself however many layers of gauze are used. I, personally, am in the habit of using ten layers of 4-fold gauze. The clip has been made for me by Messrs. Allen and Hanburys Ltd., of Wigmore-street, London.

H. E. KARSLAKE ECCLES, M.R.C.S., L.R.C.P.

REVIEWS AND NOTICES OF BOOKS

The Surgery of the Stomach and Duodenum

By SHELTON HORSLEY, M.D., F.A.C.S., LL.D., Surgeon to St. Elizabeth's Hospital, Richmond, Va. London: Henry Kimpton. 1933. Pp. 260. 5*s*.

Dr. Shelton Horsley's name has long been associated with gastric surgery, and his views as set forth in this book are thus of great interest. They are stated simply as expressions of opinion derived from clinical observations and illustrated by case records, without any attempt at statistical presentation. This is no matter for regret, since statistical tables when not compiled by an expert are frequently misleading under their guise of mathematical accuracy. Dr. Horsley devotes much attention to careful pre- and post-operative treatment. We agree with his plea for free administration of opiates during the first 48 hours after a serious gastric operation; and though routine lavage for all cases of the stomach would seem unnecessarily distressing, this is perhaps better than neglect of the stomach-tube in cases where it is actually necessary. The continuous saline intravenous drop is apparently used fairly often in the author's practice, and the original procedure is adopted of administering it before spinal anæsthesia, leaving the cannula in place so that adrenaline may be given by this route in case of emergency. Gastropexy still seems to be used in his clinic, though its indications are not clearly stated. The Janeway gastrostomy here recommended is very satisfactory, but in our view it is too complicated to be advisable considering how few months the ordinary patient with carcinoma of the œsophagus has to live.

Dr. Horsley now restricts the use of the pyloroplastic operation which bears his name practically to cases of anterior duodenal ulcer where the lesion can be excised. He advocates on theoretical grounds a modification of the Billroth I. operation, in which the duodenum is attached to the lesser curve extremity of the gastric lumen. This means that more of the lesser curvature must be left whilst the difficulties of apposition are increased. He has not established by X ray examinations or otherwise his contention that following this modification the motor power of the stomach is better than after the original Billroth I. procedure, whilst there is ample evidence of the excellent functional results of the latter. Many surgeons will feel that he does not give sufficient prominence to the anterior type of Polya operation. However, in a monograph dealing with personal experiences no exception can be taken to the selection of those methods which the author himself prefers. Surgeons interested in gastric and duodenal disorders will find many useful hints in this work.

Chronic Arthritis and Fibrositis

Diagnosis and Treatment. By BERNARD LANGDON WYATT, M.D., F.A.C.P., Director, The Wyatt Clinic; Member Editorial Staff of "Acta Rheumatologica" of the International League for the Control of Rheumatism. London: Baillière, Tindall and Cox. 1933. Pp. 202. 20*s*.

Dr. Wyatt does not approach his subject from any new angle, nor does he throw any fresh light on the many unanswered problems that these diseases present. His book is, as he says, purely technical in character and will therefore be of special help to the medical practitioner on whom lies so often the responsibility of early diagnosis. Half the book, apart from the general and historical survey, is devoted to special therapeutic measures, a welcome change from books on most other medical conditions in which treatment is generally disposed of in a few brief pages. The difficulty with the arthritides is not that we have no suitable forms of treatment, but rather that we have too many, and a suitable choice of measures needs experience and great care if good rather than harm is to result. On the subject of diet Dr. Wyatt is refreshingly broad-minded. He says: "It would be difficult indeed to find a subject about which there are more fads and fancies than are associated with foods and their rôle in the prevention and treatment of chronic arthritis . . . . there is no more justification for many of the ingrained beliefs than there is foundation for the theory that a diet of turnips will make one brave or that the application of raw beefsteak will cure a black eye." Nevertheless diet and food requirements are treated in this book in detail and the sample meals and table of food values will be very helpful. In the chapter headed Discussion and Summary an interesting table is given of the primary and secondary causes of the chronic arthritides and their relationship, prefaced by one of the best short summaries of our present knowledge of these diseases hitherto published. Dr. Wyatt stresses the importance of composite programmes of therapy to suit individual requirements although, as he says, certain therapeutic factors are of benefit to almost every patient. In adverse criticism of this book one might say that too much space is devoted to the introduction which covers a general and historical survey of the disease, not because it is uninteresting but because readers may be put off, whereas if they turn first to the later sections they will find definite help.

Die Histopathologie der Uterusmucosa

By Dr. H. T. DEELMAN, Ord. Prof. der allgemeinen Pathologie und pathologischen Anatomie der Reichsuniversität Groningen. Leipzig: Georg Thieme. 1933. Pp. 247. M.24.

THE interpretation of the appearances of scrapings from the uterus requires an intimate knowledge of gynæcological pathology; many clinical pathologists have trouble in dealing with material of this kind. Dr. Deelman's monograph is written rather for the general pathologist than for those who specialise in gynæcology. The first section deals with the decidua of pregnancy and its abnormalities and the difficulties in interpreting curettings from abortion cases are clarified. The distinction between the necrosis around the plasmoditrophoblast and the necrosis of septic abortion is emphasised and the invasion of decidua by isolated cells of the Langhans layer during normal pregnancy is recognised. A valuable description of the involuting vessels of the endometrium is included, but more could have been written of the decidual glands and the account of the degenerate villæ so frequently seen in curettings is in many ways incomplete. The section on hydatidiform mole and chorion epithelioma is very good though perhaps more technical than the general standard of the monograph. Endometritis does not receive sufficient attention although the views expressed are both modern and accurate. The most interesting chapter is that headed "Atypie" in which various abnormalities of the endometrium are grouped together. The author brings into prominence various atypical

appearances which have puzzled gynæcologists and may represent early forms of carcinoma. Some of these abnormalities have just been described in the *Journal of Obstetrics and Gynæcology of the British Empire* by John Beattie. Carcinoma of the body is well described, but hypertrophy and hyperplasia of the endometrium are not dealt with very clearly. Such conditions perhaps interest gynæcologists more than pathologists. No description is given of the normal cyclical alterations of the endometrium and the general pathologist may find some of the descriptions difficult to understand unless he remembers these. There is no bibliography, and references in the text are restricted to the well-known German handbooks; but the series of 248 photomicrographs are so good as by themselves to repay a study of the work.

Diet in Sinus Infections and Colds

By EGON V. ULLMANN, M.D., formerly Special Lecturer for Biology at the Oregon State College, and Instructor at the First Medical Clinic at the University of Vienna. London: Macmillan and Co., Ltd. 1933. Pp. 166. 10*s*.

Dr. Ullmann's thesis is that in people who are inclined to colds and diseases of their sinuses we have to deal with a tendency towards "acidosis." But by this expression he does not mean a condition which has for long been labelled acidosis by the medical profession. He is not concerned with disturbances of the basic-acid equilibrium of the blood, but with people who show a fast metabolism, burning up their reserves; these persons are of a nervous type, restless, and easily worried. The principles of his regimen are the use of only fresh food, the restriction of salt, preference of alkaline food, reduction of "animalic" proteins, reduction of carbohydrates, and the use of unrefined carbohydrates; meat is limited to 16 oz. a week, with 6 oz. of sweet-bread, brain, kidneys, spleen, liver, or fresh fish; much importance is given to the value of fruit and vegetable juices, and alcohol is forbidden. Although it contains a chapter on testing the urine for acidity and chlorides, the book is evidently written for the general American public rather than for medical men. There is doubtless some merit in this type of diet, and the use of white bread and of tinned or preserved foods, to the exclusion of a fresh and simpler diet, is a retrograde step; but Dr. Ullmann has hardly proved that his faith in the diet he recommends is based on scientific principles. An appendix contains a number of receipts by Elza Mez.

The Sterile Period in Family Life

By the Very Rev. Canon VALERE J. COUCKE, Professor of Moral Theology, Grand Seminary of Bruges; and JAMES J. WALSHE, M.D., Ph.D. New York: Joseph F. Wagner. 1933. Pp. 70. 2*s*. 6*d*.

THE first of the five chapters of this small manual contains a discussion of the moral aspect of the control of conception. Here the confessor is urged to impress upon the penitent that the malice of onanism resides not in a desire to avoid procreation (an aim which on occasions may be laudable), but in "the perversion of the order of nature and in the use of a means that is contrary to natural purposes of the function of generation." It is further contended that "God has disposed and ordained that at certain definite times the intercourse will be naturally unfruitful or rarely fruitful." In the remaining chapters, which seem to have been written by Dr. Walshe, the views of Dr. Knaus, of Gratz, and Dr. Ogino, of Japan, are expounded. The conclusion is reached that "the week before menstruation is the sterile period, and there may be a further extension of the exempt period for three days at least after menstruation." The infertility of the post-menstrual three days is, however, less to be relied upon than is that of the premenstrual week.

This is by no means the first theological pronouncement upon the "safe period," which, in the past, has been thought to occur at all stages of the intermenstrual interval, the earlier views having been based upon the erroneous assumption that the time of ovulation synchronised with that of menstruation. The writings of the Austrian and Japanese authorities mentioned above have now resulted in the application of the imposing title of "the Knaus-Ogino method" to the utilisation of the safe period for contraceptive purposes.

This latest pronouncement is in accordance with recent physiological and statistical research, but the latter suggests that the sterility of the premenstrual week cannot be entirely relied upon, and that, in fact, there is no period of the month at which conception has not occurred in some women.

Pneumolyse intrapleurale

By LOUIS SAYÉ, Professor in the Faculty of Medicine, Barcelona. Paris: Masson et Cie. 1933. Pp. 242. Fr.40.

IT has been said that a good artificial pneumothorax is better than a thoracoplasty, but that a thoracoplasty is better than a bad pneumothorax. Prof. Sayé emphasises the great differences in the results obtained from a complete and partial pneumothorax in the treatment of pulmonary tuberculosis. Under modern procedure it is often possible to convert a partial pneumothorax into a complete one by dividing adhesions which prevent the lung from collapsing. The indications for cutting adhesions are here discussed, and the methods of Jacobaeus and Maurer are described in detail. Lung tissue is sometimes found in an adhesion even at its attachment to the parietal pleura, so that section of the adhesion necessitates cutting the lung—an accident which usually leads to pyopneumothorax and a fatal issue. In order to avoid this G. Maurer, using diathermy, cuts a circle in the parietal pleura round the attachment of the adhesions which can thus be detached without injury to lung tissue. Prof. Sayé gives details of 37 pneumothorax cases in which he has divided adhesions by Maurer's technique with remarkably good results, 22 being cured. The value of sanocrysin, used in conjunction with pneumothorax, is discussed. The author's experience leads him to believe that though improvement occasionally follows small doses, it is usually necessary to give a total dose of 8–14 g. in order to obtain definite results. The book is one of a series entitled Bibliothèque de Phtisiologie, published under the direction of Prof. Léon Bernard, and can be recommended to those interested in the subject. It is well illustrated with 119 radiograms and drawings, and concludes with a useful list of references. The index might be improved.

THE HARLEY-STREET CALENDAR.—Dr. H. H. Bashford's attractive account of the lives of some of the most celebrated British doctors, reviewed in THE LANCET when it first appeared (1929, ii., 932), has been reissued by Messrs. Constable and Co. at the price of 3*s*. 6*d*., which should bring it within the reach of a very wide circle of readers.

THE LANCET

LONDON: SATURDAY, SEPTEMBER 23, 1933

AIR EMBOLUS

AIR embolism occurs as an acutely embarrassing, occasionally even a tragic, sequence of pleural puncture. Happily it is a rare event, but its rarity should not induce a false sense of security in those whose work necessitates constant puncture of the chest. It is a risk which must be taken into consideration whenever treatment by artificial pneumothorax is proposed and must not be ignored when pleural aspiration or lavage is performed. Precautions to prevent its occurrence should never be forgotten and stimulants such as adrenaline, atropine, and caffeine should always be at hand. Three cases of air embolus are reported by Dr. M. POLLAK in the August number of the *American Review of Tuberculosis*. The first occurred when an attempt was made to determine the pressure in the pleural cavity of a student aged 16 years in whom pneumothorax had been abandoned apparently as the result of an obliterative pleurisy. No air was introduced, and when the needle was withdrawn there was no evidence that bleeding had occurred; yet a syncopal attack with stertorous breathing and the exudation of blood-stained froth from the mouth followed the puncture, and Jacksonian epilepsy proved that cerebral embolism had supervened. In the second case during the irrigation of a pleural cavity which contained pus, symptoms of air embolism involving the bulbar area were noted. In both these cases recovery was uneventful. The third case, which was associated with the spontaneous rupture of a lung during an operation for phrenic evulsion, had a fatal termination; post-mortem examination revealed that the coronary arteries contained air bubbles, and that the heart, which was dilated, was full of foamy blood.

When a pulmonary vein is accidentally opened it is easy to understand the occurrence of air embolism, and the first example illustrates the classical condition and the usual course of events. In the second case, though the needle might possibly have injured a pulmonary vein, for pulmonary collapse is seldom complete and puncture is made in the dark, Dr. POLLAK considered that an injury to a pleural vein was the probable cause of the symptoms. If this is so one must assume that an air bubble had passed through the pulmonary capillaries before finding lodgment in the medulla, which, in view of the extremely minute channels through which it would have to pass, seems very unlikely. In the third case there had been no apparent injury to the cervical veins, and it seemed that the spontaneous pneumothorax, which occurred apparently at the time the phrenic was exposed, may have been responsible for the accident. The cause of the pulmonary rupture is not stated. In this country one or two cases of spontaneous pneumothorax following phrenic evulsion have been described, but here it seems that the nerve was neither sectioned nor evulsed. It must be confessed that the mechanism of air embolism is not always easy to understand, and further, that from the clinical standpoint it is sometimes difficult to differentiate between this condition and that known as pleural eclampsia, the greatest manifestation of pleural shock. This difficulty was emphasised in recent correspondence in our columns following the publication of a case of air embolism by Dr. V. R. WALKER.[1]

What steps can be taken to prevent the emergency from arising? The most obvious precaution is never to puncture the pleura without sufficient reason for doing so. The second is to see that the patient's head is at a low level when inducing a pneumothorax or giving a refill, for as Dr. POLLAK points out, both experimental and clinical experience indicate that the danger of embolus is greatest when the subject of operation is in an erect or semi-erect position. A third and most important precaution in all pneumothorax work is to watch the manometer when the needle penetrates the pleura, and to keep the stopcock of the air-container closed until a sufficient manometric fluctuation shows that the needle is in a free pleural cavity. Dr. B. W. COBBS, in the same issue of the American review, has described a simple protective technique by means of which, he claims, the risks of air embolism in pneumothorax work may be reduced to a minimum. At the commencement of an induction the bottles are adjusted so that the level of the water in the air-bottle is about 10 cm. higher than that in the pressure-bottle, the flow of air being thus away from the chest, so that at the moment of puncture there is a negative pressure in the pneumothorax needle. When the eye of the needle is closed by the tissues of the chest wall the flow of the water is checked, leaving a standing negative pressure of 4 or 5 cm. recorded on the manometer. The bottle system can then be temporarily closed and the needle thrust on till it enters the pleural cavity, when the manometer will at once come into action. When the bottle system is again opened, if the needle is in a free pleural cavity, air will be sucked into it, but if it should by any chance have punctured the lung and cut the wall of a pulmonary vein no harm will ensue, for in this case there will still be a negative pressure in the needle sufficient to prevent the entry of air into the blood stream. It should be realised, however, that even when precautions are taken air embolism and pleural shock may still occur, that no system of pleural puncture can be fool-proof, and that "to stick a needle in the chest" calls for as much care in technique and gentleness in action as any other minor operation.

THE POTENTIAL SUICIDE

SOME months ago a young woman student in a fit of depression ate six sticks of solidified methylated spirit and we expressed at the time [2]

[1] THE LANCET, 1933, i., 636, 720, 775.
[2] Ibid., July 22nd, p. 194.

a fear that the publicity given to the coroner's quest might lead to other similar cases. That fear has unfortunately been realised. At a recent inquest it was shown that a similar substance had been the cause of death of a woman, aged 61, a voluntary patient in a mental hospital. Some 16 days before her death she had been in the town on parole and had returned with it unknown to the hospital authorities. The coroner commented on the warning on cartons containing the material to the effect that it should not get into the hands of children, and the medical superintendent is reported as saying that the substance is quite as poisonous as any substance scheduled as poison. The coroner promised to write to the Home Office in this sense.

The suicide who chooses poison as a method of release searches for a substance easy of acquisition, easy of administration, and thinks in terms of the quantity required. Provided the quantity be great enough, almost any chemical in household use may produce the desired effect. Indeed, few household materials have not been turned to his uses, e.g., wireless batteries, whilst many gardens contain substances which, did he but know it, might provide him with what he wanted. How far can social restrictions go to rid the world in which the suicidal patient moves of instruments for self-destruction? And how far does the publicity given to a new and easily accessible poison increase the total number of suicidal attempts? These questions are easier to ask than to answer. It has not been proved, and scarcely could be, that the marketing of a new substance suddenly caused a rise in the rate of attempted suicide. The vision of a world where substances that might be used with suicidal attempt were scheduled or removed is not a cheerful one, for coal-gas would be the first commodity to go. As a result of two cases of yew-leaf poisoning last year, some mental hospitals have lost trees that added to the artistic amenities of a life that was too often unrelieved by beauty of its restrictions. The medical officer makes his hospital a world fit for suicides to live in and when he far-sightedly permits parole may be faced with tragedy. The magistrate, on the other hand, wants no risks to be run. To him "once a lunatic" is "always a lunatic." The attempted suicide of a girl, lately discharged from the Croydon Mental Hospital, led to observations by the bench last week in the Mansion House Justice Room which will shock many of our readers. "I suppose the hospital wanted to get rid of her," Alderman Neal is reported to have said; "I consider it nothing short of a public scandal."

Most psychiatrists believe that a suicide will achieve his end whatever restrictions are imposed, short of constant watching by nurses. In some cases the amount of supervision required and the furtiveness of the patient are unbelievable. If tragedies are to be completely avoided no patient must ever be let out on parole, or if he is, on his return he must be searched with that revolting thoroughness which constitutes part of the daily treatment of the morphinist. Any such methods would be intolerable in mental hospital practice. The alternatives of "no parole" or frequent searches are equally degrading for the recovering patient. But whilst it is so hard to circumvent the secrecy of some intending suicides, it would seem less difficult to spread the knowledge that the suicidal intent is a commoner feature of our social life than we commonly admit, and that that intent may come upon a man with the suddenness of a tempest or be secretly planned with subtlety. It is an intent which, in the milder degree as a phantasy, has, if we were honest, crossed most of our minds, and this may explain something of our fears, precautions, and reactions when the subject is even whispered. Indeed, the mental hospital patient is not so very far from any one of us, though we seldom like to remember this except when we are reminded of a common catchword about genius. If we could but bring this conception to bear upon our thoughts of the insane we should mould a public opinion that would see less difference between a mental hospital and a hospital for rheumatic diseases. Persons might then come to consult a doctor about suicidal feelings with as much aplomb as some women consult their friends and many doctors about pains in the back.

TUBERCULOSIS OF THE LARYNX

IT is established that the larynx is very rarely a primary focus of attack by the tubercle bacillus. Its invasion is a complication, and one of the most dreaded complications, of pulmonary tuberculosis. The sheet anchors of treatment are sanatorium régime and vocal rest, with judicious use of the galvano-cautery or other local stimulating measures, where intractable lesions remain after an ample trial of general methods. No striking advances in the methods of treatment in tuberculosis of the larynx have been made in recent years, but the outlook has gradually become far more favourable. This was clearly shown during the discussion, reported on another page, which took place before the section of oto-rhino-laryngology of the British Medical Association in Dublin. One reason for improved statistics is that artificial pneumothorax is being employed more frequently in the treatment of pulmonary phthisis and has in suitable cases an excellent influence on the laryngeal disease. Sir Robert Woods, the president of the section, noted that the tuberculous lesion is a chronic process which does not encourage sufficient tissue reaction; the cautery provides a stimulus to excite such reaction, and in his experience X ray treatment by a series of five-minute exposures once or twice a week is also useful for this purpose. The Kromayer lamp, as modified by Dr. William Beaumont for application to the larynx, probably acts in a similar way. Artificial sunlight, on the other hand, is held to exert its action through the general system. Its use is strongly advocated by Strandberg, who employs it on out-patients. Sir StClair Thomson has not found it of any value among patients in sanatoria; but Mr. R. Scott Stevenson traces some benefit to its application

to such cases, and according to Dr. R. R. Trail it has given good results at Midhurst in a type of case which did not respond to pneumothorax. In the course of the discussion Mr. P. J. Keogh and Mr. A. D. Sharp called attention to the increased risk of invasion of the larynx which resulted from the presence of infection in the antrum and the other nasal sinuses in phthisical patients, and from nasal obstruction. Mr. H. S. Barwell pointed out that the high altitude of Swiss resorts rendered them unsuitable for laryngeal cases. His reminder that silence is a severe and depressing measure, on which it is cruel to insist unless there is a prospect of cure, is timely. In this connexion it is often forgotten that the forced whisper requires more effort, and is therefore more harmful than low speech.

In incurable patients the treatment of severe dysphagia often becomes of the greatest importance. Mr. Scott Stevenson had found injection of the superior laryngeal nerve effective in 50 per cent. of cases; the good results obtained in a smaller series by Forrestier Raine and A. L. Banyai, who expose the nerve under local anæsthesia, inject it with alcohol, crush, and divide it, were noted in our issue of Sept. 9th, p. 605. The suggestion made by Sir James Dundas-Grant [1] that the sensitive spot should be found with a probe and treated by cautery-puncture is well worth trial before more drastic measures are taken to alleviate pain. In cases of extensive infiltration at the upper aperture the pain is often intense; in these the removal with punch forceps of the free part of the epiglottis or of part of the swollen arytenoid, as advised by Mr. Barwell, gives great relief and causes but little disturbance to the patient. In incurable cases such relief should be a primary consideration and is too often neglected. But the decision between curable and incurable cases is not always easy to make. The factors influencing prognosis were set out by Dr. F. R. G. Heaf, who pointed out that the patient's resistance, temperament, symptoms, and habits must be considered as well as the local condition. He attaches much importance to the information derived from serial examinations of the blood; in his experience a rapid sedimentation-rate, with a high monocyte and low lymphocyte and eosinophil counts, indicates a poor look-out. The discussion generally showed the value of detail in the treatment and management of this disease, the cure of which demands careful attention from the doctor, fortitude from the patient, and a large measure of patience from both.

[1] THE LANCET, 1932, ii., 999.

ANNOTATIONS

ADMINISTRATION OF THE CHILDREN ACT

IN order to facilitate the execution of the Children and Young Persons Act which comes into force in November, the Home Office has circularised justices and others concerned with the future administration of the law. The circular is designed to bring into relief the main points of the Act—its advance on the old Act and the facilities for treatment of juvenile offenders and young offenders needing care. The circular persistently lays claim to the official recognition of the need for studying the individual child and his circumstances, but nowhere in its pages can be found any fundamental understanding of the social and psychological processes making for delinquency. In the spate of administrative details which the circular naturally contains, there are of course details which indicate the advances in the oiling of administrative wheels and in easing the path of magistrates. The provision of a panel of special magistrates is a wise change, and the call for younger presidents of juvenile courts is a recognition of the need for modern minds in touch with the needs of youth. While the terms "conviction" and "sentence" are to be eliminated, as "reclamation" should be the object of the new Act, there is insufficient evidence that its framers have any clear conception of the implication of this term. Throughout one is made conscious of the fact, as the circular itself states, that there is no change of principle. Few indeed were so optimistic as to hope for such a change, but unless the elimination of the words "conviction" and "sentence" has no meaning, it can only indicate that the law regards the offences of children as different from the offences of adults. Some psychopathologists and sociologists would admit of no distinction between juvenile and adult delinquency, but taking the Act as it stands as a piece of legislation for juvenile offenders, it suggests that those who framed it feel that principles are involved but fear to admit what would call for a complete change of attitude and a clean cut with traditional usages. Scientific detachment, however, would go further and add that while recognising the humanitarian pressure which has formed the new vocabulary and the new provisions, the Act still fails to recognise the advances in psychological and social understanding of crime, and in addition fails to avail itself directly and officially of institutions and doctors who have made the subject their special study.

One of the manifestly valuable sections of the Act to which the attention of magistrates is directed is the Section 61 with regard to the extended power of the court to deal with those who are beyond the care of their parents. All who may need protection are now to be provided for. But while the court can dispose of such children in foster homes and institutions—and such children are frequently without either social or psychological defects—the parents are in need of attention. A special type of probation officer with specific training is called for here, to deal with social and psychological problems of the parents. With regard to remand homes, responsibility is now placed in the hands of local authorities rather than the police, but it will need doctors and social workers with really expert knowledge to diagnose the factors involved and deal with the situation. By raising the age of admission to such homes we shall however create fresh problems, such as the mixing of adolescents with children, which may be dangerous in the absence of careful classification. Parliament decided that juveniles of unruly or depraved character should be liable to imprisonment if found to be unfit for detention in custody

in a remand home. The memorandum gives the unfortunate impression of emphasising the distinction between special cases of unruly or depraved conduct and so-called minor delinquency. The moral revulsion which these special cases may produce must be admitted, but it would be unscientific to deal differently with such cases, and perhaps unmerciful too. The difficulty which must arise constantly, at any rate for many years to come, is that the Home Office is obliged to work through magisterial and judicial tribunals for the most part accustomed to old-fashioned ideas of penology and retribution. Better coördination must await the establishment of more widespread confidence in the results to be obtained by the application of modern conceptions of psychopathology in the treatment of juvenile delinquents. To this end the magistrates should be told not merely of the cogs of a new administrative machine, but also of the existence of methods, personnel, and institutions which are capable of dealing with larval and established delinquency, and of affording educational facilities to probation officers who are only too eager to learn the principles of the new orientation in the sociology and psychology of crime. Naturally some of the new juvenile courts will show themselves more progressive than others. Successful experiment will stimulate advance; indeed, the new procedure does but follow where some of the London courts have already led. Psychiatric methods are, according to the recent reports of the Prison Commissioners, already tentatively applied to certain inmates of penal institutions. Treatment, be it noted, is deferred until the patient has been labelled a criminal. The Children and Young Persons Act marked a cautious step forward at a moment when the rigours of national economy grudged any form of fresh public expenditure. Money is wanted for the establishment of special observation centres. The Magistrates' Association has foreshadowed the promotion of a new Bill for this purpose.

A DENTAL PIONEER

William Dall, who was a great craftsman of a type which has never been common in dentistry, died this year, and the materials for his book [1] which were collected for publication as long ago as 1911 have been revised by his widow with the assistance of Mrs. Lindsay. The work thus makes a somewhat belated appearance. It has interest as a pious memorial to a brilliant technician and a pioneer in the application of porcelain to the conservation of teeth and as a contribution to the history of the evolution of porcelain in operative dentistry, but as a practical contribution to modern methods of filling teeth it is of little value. In 1911 Dall's methods marked an advance and gave to the profession new ways of treating the ravages of caries or the results of injury. But the whole trend in the development of porcelain as a filling material has been in the direction of fused porcelain from high fusing body. It is this method which has made possible that highest form of æsthetic restoration, the jacket crown. Dall's method consisted of constructing inlays out of ground porcelain and, by means of special burs, of shaping the cavity so that the inlay fitted it. This entailed the destruction of sound tissue, often avoided by the use of plastic materials or fused inlays. The destruction of sound tissue to make the cavity fit the filling is a serious defect in Dall's method and one which makes his technique, except very occasionally, obsolete and unsound. To those desirous of learning how the technical side of dentistry has evolved, there is much here that is of interest. It is impossible not to admire the ingenuity with which Dall adapted his technique to a variety of conditions. The introduction of translucent cement materials, despite their comparative impermanence, has made porcelain inlays, whether ground or fused, almost a forgotten art. The appearance of this book may serve to recall to an indifferent generation that high fusing porcelain body, though demanding a high standard of craftsmanship, can in suitable cases give results unequalled for beauty and permanence. The ground inlay as invented and advocated by Dall is unlikely ever to come into fashion again, though here and there some enthusiast may use it and, like Dall, obtain excellent results with it.

[1] Ground Porcelain Inlays. By William Dall, L.D.S. R.F.P.S. Glasg. London: Henry Kimpton. 1933. Pp. 196. 21s.

RESECTION OF THE THORACIC ŒSOPHAGUS

THE short expectation of life of the average patient after extirpation of an œsophageal cancer renders him a poor subject for the elaborate operation of œsophagoplasty, although it has often proved successful in cases of simple stricture of the tube. Wendel [1] in a recent paper states that there are records of more than 150 such interventions; but whether colon, jejunum, or a portion of the stomach is employed, it is only after a series of operations, often spread over a period of more than a year, that natural swallowing becomes possible, and the number of really satisfactory functional results is very small. No carcinoma patient has ever survived such attempts and in the world literature there are perhaps only two cases in which natural swallowing was restored following extirpation of carcinoma of the œsophagus. In one case H. Lilienthal (1921) was able to employ a short skin tunnel posteriorly, and in the other E. Gohrbrandt (1927) restored continuity by direct suture after extirpation of a growth in the lower œsophagus, operation being carried out from below the diaphragm.

Two methods have been used fairly extensively in man to avoid the difficulties of œsophageal anastomosis. Almost 20 years ago F. Torek excised a carcinoma of the thoracic œsophagus together with the oral end of the tube which he brought out in the neck, leaving the patient with a permanent œsophageal fistula in this site. The patient survived and nutrition was ensured by means of a rubber tube which joined the œsophageal fistula in the neck to a gastrostomy opening. This type of operation has been repeated with occasional success by other surgeons. F. Sauerbruch has worked along different lines, using an invagination method designed to avoid soiling the operation field. The œsophagus is crushed and ligated above and below the growth, which is then invaginated into the stomach, and natural separation is awaited. The final cure of a patient by this means has not yet been attained.

In a recent Hunterian lecture L. O'Shaughnessy [2] discussed some of the difficulties which had attended surgery of the œsophagus and described a method of resection in which an omental graft was employed to ensure safety of the suture line. In his experiments linen thread was used and, in order to avoid tension on the anastomosis, a partial dislocation of the stomach into the left chest was carried out. Now R. Ingebrigtsen has recorded [3] one of the most remarkable series of animal experiments in the literature of the œsophagus. He was able to resect portions of the thoracic œsophagus in seven cats,

[1] Arch. f. klin. Chir., 1929, clvii., 295.
[2] Med. Press and Circ., 1933, cxxxv., 150.
[3] Act. chir. Scand., 1932, lxxxi., 446.

restore continuity, and obtain healing in all cases. In an earlier series of experiments he had found that catgut sutures conveyed infection from the lumen to the surrounding parts by means of a process of imbibition, and he attributes his present success to the use of fine silk saturated with paraffin as a suture material. In his animals Ingebrigtsen was able to restore continuity after resection of four centimetres of the tube, and he suggests that in man approximation after the loss of eight centimetres should be possible. He has employed his suture clinically in the cervical œsophagus and obtained immediate healing of wounds. The case in which Sauerbruch [4] carried out a transpleural resection of the lower end of the œsophagus and restored continuity by end-to-end anastomosis is mentioned as a parallel in human surgery to Ingebrigtsen's experiments.

It seems unlikely, however, that resection and end-to-end anastomosis of the human œsophagus for carcinoma will be possible unless a dislocation of the stomach through the diaphragm is carried out. The possibility of mobilisation of the stomach is illustrated by a patient described by O. Kirschner (1920) who survived after the viscus had been displaced upwards to the level of the clavicle, and in the case of a tumour at the lower end of the œsophagus such extreme dislocation would not be required. An intervention of this type will always carry a high mortality, but at least, at the cost of a single operative ordeal, it offers to the survivor the continuance of a normal existence.

NORMAL COLOUR VISION

THE summary of experimental work on colour vision prepared by Mr. W. O'D. Pierce for the Medical Research Council [5] is welcome, if only because the author has dared to break the tradition of writers on the subject that a new theory must be advanced with every publication. Mr. Pierce has sifted and summarised the work done since 1910 on the normal variations in colour vision in different individuals. This is a matter of the utmost importance, for the range of variation among normal individuals is considerable. Moreover the older observers were not always alive to the discrepancies in colour vision under slight variations of illumination, pre-exposure, fatigue, and other extraneous factors. Much of the earlier work is therefore of doubtful value, and yet incontrovertible data on the normal and its variations are essential for any understanding of colour blindness and the practical problems bound up with it. In the elaboration of normal standards for such a purely subjective thing as colour vision, uniform experimental conditions are thus an obvious requirement; but it is also necessary to realise that even with the most rigid control, individuals will give different responses in different experiments. These are *individual variations*, and have to be distinctly separated from the response of different people—*individual differences*.

Fifty years ago Lord Rayleigh showed that when different people are asked to match a homogeneous yellow with a mixture of homogeneous red and green, some people require much more red and others much more green than the normal. The Rayleigh equation has been responsible for much speculation and for many attempts in the classification of colour defectives. The general assumption has been that the people who require more of a green colour to produce matching mixture are partially blind to that colour, and graduations in colour blindness have been held as proved by these observations. It is interesting to note that recent work has departed radically from this view. Hess, Oloff, and others speak of supernormal sensitivity to colour. It is held that many who have been classed as colour weak, because they do not accept the normal Rayleigh equation, have really required an excess of the colour in question to mask their greater sensitiveness for the complimentary colour. In this view people are "red-sighted" rather than green-blind, "green-sighted" rather than red-blind, and so on. Hess quoted a case of an oculist who was over-sensitive to red and had normal sensitivity to green; he could not pass the Stilling test, but in the spectroscope test he could go beyond the normal limits for red. How far this more positive view of colour defects will help to disentangle the difficulties of colour vision remains to be seen.

Another direction from which valuable data have come is the study of the development of the colour sense in children. It appears that children below the age of 3 tend to match on form rather than colour, whilst between the ages of 3 and 6 colour is preferred to form. Curiously enough at the age of 6 form is once more preferred, and the influence of colour increases steadily up to the adult level—which, incidentally, is low, for only 10 per cent. of adults choose on colour. Appreciation of colour makes its appearance early in life. Working with a large number of infants ranging in age from 69 days to 2 years and with older children and adults as controls, it was found by Staples that colour is distinguished from grey at the age of 3 months, becoming an increasingly effective stimulus until the end of the fourteenth month. Probably by 12, and certainly by 15 months, red, yellow, blue, and green are seen clearly, though preference for different colours is shown. Even at this early age a sex difference in colour vision is noticeable; girls lose interest in yellow and gain it in blue, which is at its maximum effectiveness at 9 months. Baby girls also show a readier response to colour in general than do boys.

THE NURSE'S RISK OF TUBERCULOSIS

IT is only of late that certain hospitals have squarely faced their responsibilities in relation to the tuberculosis risks run by their nurses. In the past little has been done to determine the exact degree of these risks, and indeed, as we observed last week (p. 659), it is difficult to devise methods to prove whether or not the nursing care of the tuberculous really is a hazardous occupation. It is therefore not surprising that the measures designed to reduce the risks have been of a general rather than a specific character. If, however, hospital nurses are specially liable to contract tuberculosis, it is evident that appropriate precautions must be taken. The pioneer work of Heimbeck and Scheel at the communal hospital of Ullevaal in Oslo in this field is stimulating investigations on similar lines elsewhere, and in *Hospitalstidende* for June 29th there is a paper by Dr. C. J. Jacobson on the tuberculosis morbidity and the Pirquet test in nurses in a Danish general hospital with a tuberculosis division. Here it has been the practice since 1927 to subject every newcomer among the probationer nurses to a systematic physical examination which includes the Pirquet test. If it is negative, it is repeated eight days later, and, if still negative, at half-yearly intervals till it becomes positive. As long as it is negative, no nurse is allowed to work in the tuberculosis division. Even the positive reactors who are employed in this

[4] Arch. f. klin. Chir., 1932, clxxiii., 457.

[5] Individual Differences in Normal Colour Vision: a Survey of Recent Experimental Work, 1910–1931. Special Report Series No. 181. London: H.M. Stat. Office. Pp. 96. 2*s*.

division are carefully examined, both at the beginning and on the conclusion of their work here. Radiograms are taken of the lungs of every new probationer, and the sedimentation test is also systematically employed. Of the 149 probationers examined during the period 1928–1932, as many as 116 gave a positive Pirquet reaction at the first test, and 15 became Pirquet positive within six months of the commencement of their duties. These findings are notably at variance with those of Heimbeck, who found about 50 per cent. of the probationers examined to be Pirquet negative. The marked differences in the density of the population of Denmark and Norway may perhaps account for the lack of conformity in these observations. While Heimbeck has found a negative Pirquet reaction to be of ill omen to a probationer as far as her expectation of tuberculosis is concerned, Jacobson considers his own findings in this respect too uncertain to warrant any general conclusion.

RESEARCH ON GONOCOCCAL INFECTION

A COMMITTEE has been formed in America by the division of medical sciences of the National Research Council, in coöperation with the American Social Hygiene Association, with the purpose of collecting, analysing, and collating our present knowledge of the gonococcus and gonococcal infections, especially as regards bacteriology, pathology, immunity, mechanism of infection, and some of the forms of therapy. At the close of the preliminary survey this committee, with the assistance of a conference of experts, will compile a report with the object of stimulating interest in the study of the gonococcus, of providing a point of departure, and of suggesting promising leads for further investigation. The survey will cover published work and include studies which were incomplete or whose results were inconclusive at the time of its appearance. Dr. Stanhope Bayne-Jones, chairman of the committee, invites coöperation from all workers interested in this field; other members of the committee are Dr. Edward L. Keyes, Dr. Walter Clarke (secretary), and Dr. Francis Blake, chairman of the division (ex officio). Communications and reprints may be addressed to the secretary of the Committee for Survey of Research, Room 1101, 450, Seventh-avenue, New York.

CHRONIC ILLNESS

THE lack of classification in the provision for the care of the chronic sick in this country must imply waste of effort. Attempts are now being made by the London County Council, King Edward's Hospital Fund, and other bodies to organise certain hospitals offering facilities for their accommodation and treatment, but we have still no institution such as the Montefiore and others in the United States which are adapted solely for research into as well as treatment of chronic diseases in general. A vast amount of information on chronic disease as manifested in New York City can be obtained from the results of a survey recently made by the Welfare Council of the City.[1] A census was taken of all persons, excluding those suffering from pulmonary tuberculosis, mental disease, blindness, and deafness, "who have been or are likely to be incapacitated by disease for a period of at least three months and whose incapacity will probably continue for an indefinite period" and who were under the care of medical or social agencies in New York City in a given week in 1928. It is estimated that these represent about one-third of the total chronic sick and hence that about 1 per cent. of the population of New York are thus incapacitated. Among other surprising conclusions it was found that chronic illness is by no means largely a prerogative of old age, nearly half the sufferers being under 40 years old. The chief obstacles to progress were considered to be the prevalent idea that "chronic" was synonymous with "incurable" and also the natural leanings of the medical profession towards the pitched battles of acute disease rather than the trench warfare of chronic complaints. Broadly speaking three types of care are considered to be required: "A" or active medical care for diagnosis or treatment; "B" or skilled nursing care; and "C" or custodial care by a competent attendant. On several grounds, among them the fact that attention paid to public health pays large dividends, there is a trend towards more and more official responsibility for those chronically ill and it is being increasingly recognised that mere herding into institutions goes no way towards solving this problem. In New York at any rate it is held that a definite campaign is needed to create public recognition that the chronic diseases offer the next great field in public work to be cultivated and that the responsibility of society is at least as great toward the chronic as toward the acute sufferer. One of the difficulties in this country in research on chronic cases is that trained nurses are no more ready than doctors to spend their lives attempting to alleviate the discomforts of chronic patients, and it is by no means easy to secure and retain a nursing staff of the necessary standard of skill and intelligence.

[1] Chronic Illness in New York City. By Mary C. Jarrett. Columbia University Press. 1933. Two volumes. Pp. 545 and appendices. 25s.

THE PREVALENCE OF NARCOTIC ADDICTION

ALARMIST statements have recently appeared in daily papers about "the drug traffic that cannot be checked" and "the lengthening death-roll from narcotics." In one of these it was alleged that the addicts in this country number no fewer than 25,000, and that morphine and opium victims are increasing. But it is, in fact, not possible to arrive at any satisfactory estimate of the number of addicts in this country, for no notification or registration system, such as has been attempted in other countries, exists here. In the absence of any census of addicts, which indeed is hardly practicable, recourse can only be had to other sources of information in order to gain some notion of the extent of addiction to narcotic drugs in any community. In 1926 a departmental committee of the Ministry of Health, in reporting upon addiction to morphine and heroin, after taking evidence from medical men and others stated that "in this country addiction to morphine or heroin is rare," that morphine was more frequently the cause of such addiction, and that "a relatively high proportion of cases occurs among those who, by reason of their occupation or otherwise, have special facilities for access to the drugs." This committee were further of opinion that addiction in this country is diminishing, and that this "is largely attributable to the restrictions imposed by the Dangerous Drugs Acts." In 1932 the Home Office, in its annual report to the League of Nations, in accordance with the Opium Conventions, asserted with confidence that "drug addiction is not prevalent in Great Britain," that only 69 prosecutions had taken place under the Dangerous Drugs Acts, 1920–25, and that seizures of smuggled drugs had been few and inconsiderable in amount. It has, of course, to be remembered that addiction may continue for long unsuspected, that its victims are ingeniously secretive, that illicit traffic in morphine, heroin, and cocaine may easily

escape detection, and that the peddling of these narcotics, especially in the underworld of large cities, is apt to elude official vigilance. Nevertheless, there is sufficient ground for believing that in this country narcotic addiction is probably less prevalent than on the continent or in the New World, and that thanks to the honest endeavour to give effect to the International Conventions of 1912 and 1925 by legislative and administrative effort, the illicit use of opium, morphine, heroin, and cocaine is less than was the case a few years ago.

THE LATE PROF. FÜLLEBORN

THE death on Sept. 9th of Prof. Friedrich Fülleborn means much to those who knew him as director of the Tropical Institute at Hamburg, of which he was one of the founders in 1901. A scientist of international reputation, he will chiefly be remembered for his pioneer work in helminthology, in which he was a worthy successor to Loeckhart and Loose, but his studies on anthropology and pure zoology are equally well known. In 1926 he was appointed to the chair of tropical medicine in the University of Hamburg, and two years ago, on Nocht's recommendation, he became director of the institute. He saw a good deal of military service as regimental medical officer in the Herero war and in East Africa; called up for service in 1914 he found himself immediately at the front and was badly wounded, afterwards serving as a malaria expert on the Balkan front. Fülleborn was one of the earliest pupils at the London School of Tropical Medicine, and remained throughout his life a staunch admirer of Patrick Manson. He was a good judge of human nature, a connoisseur in art, and a confirmed epicure. He was well known in every country in Europe and America, and was particularly welcome in England when he returned after the war on a kind of pilgrimage to visit the shrine of Manson—and also, he would jocularly remark, to partake of a saddle of mutton at Scott's. He was a corresponding member of the Royal Society of Tropical Medicine and of the Royal Society of Medicine.

EXERCISE AND PREVENTIVE GYNÆCOLOGY

SOME exercises for pregnant and puerperal women are set out in detail on another page, not because they could safely be prescribed for the patient's use without expert supervision, but in order to show the plan on which they have been designed. The stress laid on correct posture is in itself of value to the prospective mother even more than to the rest of the community, and exercises for mobilising and relaxing groups of muscles provide excellent training in control. It is to be noted that many of the movements are made in the lying, kneeling, and sitting positions, when the weight of the body does not rest upon the lower limbs. In treatment devised for visceroptosis and prolapse the legs and pelvis are raised and supported. Exercises are mostly performed to gramophone records, stress being laid on their æsthetic side. The hope of expediting the return of her figure to normal after childbearing will encourage a patient to persevere with exercises during pregnancy, which are performed in such a position that venous engorgement of vulva or legs is not increased. The merit of the so-called "delivery exercise" is possibly more psychological than physical. The feeling that she is doing something in advance to help herself over the crucial moment, that she has at least familiarised herself with the posture she will be asked to take up, and with the kind of effort she may be asked to make will in itself bring a measure of confidence to a prospective mother. The attempt to promote lactation by arm movements has the advantage over massage that no direct pressure is made over the breast, and that risk of accidental infection of the nipple is almost negligible. Practice in contracting the sphincters and levator ani is certainly likely to help to restore tone to the muscles of the pelvic floor after childbirth. We understand that while some women find these exercises tedious, others welcome them as an agreeable diversion, and that the latter are in the majority.

TUBERCULOSIS CONTROL IN AMERICA

A CLEAR and complete description of the measures taken for the control of tuberculosis in an important urban district has been provided by Dr. B. Goldberg.[1] The American administrator is faced with one difficulty, which does not concern his English colleague. The members of a European community, being mainly of the same race, exhibit a similar degree of immunity to tuberculosis as the result of past racial infection. The large admixture of native races specially susceptible to the more acute types of tuberculosis in American urban communities raises difficulties which must be a constant source of embarrassment to the public health authorities. Thus in 1930 the tuberculosis mortality among the negroes of Chicago was more than five times larger than that among the non-coloured citizens. The position is in some areas even worse with regard to the Mexicans who have entered the country in recent years to supply the cheap labour displaced by the restriction of the immigrants from Europe. The problem of tuberculosis among Red Indians has ceased to be one of any importance, for that noble race is now almost extinct. Civilisation offered a poor exchange when the first of the gunmen replaced the last of the Mohicans.

It is to be feared that Dr. Goldberg's description of the powers with which a medical officer of health is armed will induce a feeling of envy in the mind of the corresponding English official, whose only weapon is a regulation concerning compulsory removal which is hardly ever, if ever, enforced. The Illinois Department of Public Health evidently knows how to deal with the recalcitrant. The careless consumptive who cannot be segregated at home is either removed to hospital or effectively isolated at his residence, where a large red placard is posted informing the public that here is a centre of infection and advising the visitor (in block letters not less than two inches in height) to "keep out." Chicago has a rule that no child under 16 years of age may share the same home or apartment as an "open" case of pulmonary tuberculosis, and Dr. Goldberg assures us that this rule is enforced. It is gratifying to note that in 96 per cent. of cases segregation is assured by a friendly adjustment between health official and patient. Social workers are too apt to forget that reasonable discipline directed without fear or favour towards the public welfare provokes little resentment. Timidity of approach is fatal in the management of public health problems. Dr. Goldberg provides interesting descriptions of the modern tuberculosis dispensary in all its departments, and describes recent developments in the planning and

[1] Procedures in Tuberculosis Control. By Benjamin Goldberg, M.D., F.A.C.P., F.A.P.H.A., Associate Professor of Medicine, University of Illinois; formerly Medical Director, City of Chicago Municipal Tuberculosis Organisation. With a chapter on Sanatorium Planning by Thomas B. Kidner, New York City, and an introduction by David J. Davis, M.D., Ph.D., Dean of the College of Medicine, University of Illinois, Chicago. Philadelphia: F. A. Davis Company. 1933. Pp. 373. $4.

conduct of sanatoriums; the chapters which deal with these subjects contain much information which may be profitably applied to similar institutions in this country. The English reader will enjoy the racy sections which discuss educational methods for the masses, and include radio addresses, while retaining his conviction that many of the methods of propaganda described could not be used effectively in this country.

TRICHOMONAS VAGINITIS

Trichomonas vaginalis was discovered in 1837 by Donné, and was at first regarded as a harmless occasional inhabitant of the vagina. It is a flagellate protozoon which varies in size from a little larger than a polymorphonuclear leucocyte to a little smaller than a vaginal epithelial cell. The question of its pathogenicity has been discussed for many years. It is often found in women in whom the vaginal secretion is normal; but the same can be said of staphylococci and hæmolytic streptococci, which are undoubtedly sometimes the cause of vaginitis. L. Nürnberger, writing in the Veit-Stoeckel "Handbuch der Gynäkologie," regards the organism as pathogenic because five women with vaginitis were found in whom cultures grew only trichomonas and Döderlein's bacillus; in one case a pure culture of trichomonas was obtained from the posterior fornix. In the great majority of patients other organisms are also present in large numbers, serving as food for the trichomonads, and some observers have maintained that the protozoon only invades an already unhealthy vagina, and is not the primary cause of the inflammation. H. Close Hesseltine has recently supported this view.[1] He found a non-hæmolytic streptococcus always present, and states that it is capable of producing the typical "trichomonad vaginitis" in the absence of trichomonas. Most authors, however, believe that trichomonas is itself sometimes pathogenic, causing acute inflammation, with numerous small red areas on the vaginal walls and the portio vaginalis of the cervix, and a characteristic profuse yellow and offensive discharge, which is frequently frothy, and contains enormous numbers of the protozoon. The patient usually complains of pruritus, and the vulva and the adjacent portions of the thighs may be excoriated. The diagnosis is made by the immediate microscopic examination of a drop of discharge diluted with warm saline on a warmed glass slide. The motile organisms can be identified under a ⅙ in. objective, but the flagellæ are better seen with an oil immersion lens and dark-ground illumination.

Trichomonads are also sometimes found in the colon and rectum, the bladder, and the mouth, and it is uncertain whether the vaginal type is a distinct species. The source of the infection is difficult to determine, and there is very little evidence about its mode of spread. I. F. Stein and E. J. Cope [2] found very few women with trichomonad vaginitis who had the organism also present in other situations, and they concluded that the vaginal and other strains were distinct. Clinically, there is some evidence that reinfection of the vagina from the rectum and bladder is possible, and this may be one reason for the difficulty in curing the disease. Trichomonas has also been found in the prostatic secretion of a man whose wife had the typical vaginitis. Treatment is liable to be unsatisfactory, and the discharge is especially prone to recur after menstruation, which seems to favour the development of the organism. Nürnberger advises thorough cleansing of the vagina with soft soap, followed by swabbing with a 1/1000 aqueous solution of perchloride of mercury, and the application of a boro-glycerine pack. Mercurochrome, methylene-blue, brilliant green, formalin, Lassar's paste, and quinine sulphate have been recommended by various authors. They all kill trichomonas rapidly on contact, but often fail to prevent recurrence of the disease. Hubert Jacobs [3] has found application of a preparation of hexyl resorcinol to the vagina, followed by a lactic acid douche, to be the most effective measure.

Dr. Goodall, in the communication published in THE LANCET last week, advises yet another method, that is, vaginal cones of 1 per cent. picric acid, which have the advantage that the antiseptic is present in the vagina for long periods and can penetrate all over the cavity. Mere swabbing with picric acid is ineffective because it is almost impossible to cleanse the entire surface of the vagina, and living trichomonads will remain between the rugæ. Dr. Goodall advocates his method as a specific cure for this troublesome infection, noting that the possibility of a patient's intolerance to picric acid must be borne in mind. The chief difficulty, however, must be to persuade patients to use the cones. The indelible stains caused by the antiseptic may cause them to refuse to carry out a treatment the effectiveness of which depends entirely on their coöperation.

A NEW MAMMALIAN HEART PREPARATION

IN physiological and pharmacological investigations on the heart two preparations have hitherto been in vogue, namely, the isolated heart perfused via the coronary vessels, and the heart-lung preparation of Starling. Both have been fruitful in results, but both have limitations. The former is simply a flaccid muscle perfusion, in which the heart does no external work; the latter is complicated by the presence of the lungs, the behaviour of whose vascular bed is an uncontrollable factor rendering difficult the interpretation of pressure and other records. Up to now it has been impossible, owing to technical difficulties, to make a preparation in which the heart pumps blood in the normal way, and yet where the whole circulation is completely under the control of the operator. I. de Burgh Daly and W. V. Thorpe,[4] replacing the lungs by a mechanical oxygenator, appear recently to have overcome these difficulties, and their preparation, besides ranking as a technical achievement of high order, should throw light on many physiological and clinical problems. The left and right sides of the heart can be studied separately, and the amount of work done by each measured; moreover, the individual loads can be varied at will. By overloading one or other side of the heart it should be possible to compare the embarrassment of the heart resulting from obstruction to the pulmonary circulation (e.g., as in emphysema) with that following, say, injury to the aortic valve. Also, by comparing the behaviour of this isolated heart with that of the heart of a heart-lung preparation, it may be feasible to estimate the part played by the lungs in various conditions; for instance, how far they act as a blood reservoir in mitral disease, or, as the authors themselves suggest, how they affect the filling of the heart when the intrathoracic pressure is reduced. The ignorance as to what precisely happens to the circulation when a deep breath is taken is largely due to the fact that the

[1] Amer. Jour. Obst. and Gyn., July, 1933, p. 46.
[2] Ibid., June, 1933, p. 819.
[3] Med. Jour. Australia, July 22nd, p. 111.
[4] Jour. Physiol., 1933, lxxix., 199.

pulmonary capillaries as well as the heart must be affected by the changed conditions inside the chest, and in their turn must secondarily influence the heart action. A further useful feature of the preparation is that the coronary blood flow can be accurately measured without further complicated apparatus or insult to the heart. It should therefore make it possible to gain a very clear picture of the action of drugs and toxins. It will not only be evident whether they dilate or constrict the coronary arteries, but how they affect the coronary circulation as a whole. More important still, the effects of such alterations in coronary blood-supply, and of the drugs themselves, will appear on the records of output and work done by the two sides of the heart. These records will be capable of direct interpretation, coincident effects on the pulmonary circulation having been eliminated. It is a temptation to enlarge upon the possibilities of a new technique, but its potential value is best known to its inventors, and its application must be left for the time being in their hands. It seems to us, however, that although the life of this particular preparation is limited to a single day, and the experiments performed with it necessarily of an "acute" character, it may result in more interest in the heart as a dual organ, the two halves of which are subject to different stresses and strains to which they may react individually.

OPENING OF THE MEDICAL SCHOOLS

In connexion with the opening of the session at the London medical schools the following arrangements are announced :—

Charing Cross Hospital.—Prizes will be distributed on Friday, Sept. 29th, at 4 P.M., in the hospital by Dr. W. Langdon Brown, regius professor of physic in the University of Cambridge, with Dr. Gordon Holmes in the chair. On the following Saturday and Sunday (Sept. 30th and Oct. 1st) there will be a week-end post-graduate course, admission being restricted to old students of the hospital. On Saturday, at 7.30 for 8 P.M., the annual dinner of past and present students will be held in the Café Royal (Louis XVI. Suite), Regent-street, W., Dr. William Hunter presiding.

Guy's Hospital.—On Tuesday, Oct. 3rd, at 3 P.M., the prizes will be distributed by Sir Gowland Hopkins, professor of biochemistry in the University of Cambridge, who will deliver an address. The old students' dinner will take place on Friday, Oct. 20th, at 7 P.M., in the Connaught Rooms, Great Queen-street, Kingsway, W.C., when Mr. C. H. Fagge will be in the chair.

King's College Hospital.—On Saturday, Sept. 30th, from 2–6 P.M., there will be lectures and demonstrations open to all practitioners as well as to members of the medical school. Practitioners are also free to attend the series of post-graduate lectures to be delivered in the lecture theatre of the medical school on Thursdays at 9 P.M. from Oct. 12th onwards, and a special course in preventive medicine (see page 726) on Thursdays at 4.30 P.M. The annual dinner of past and present students will be held on Saturday, Sept. 30th, 7 for 7.30 P.M., at the Connaught Rooms, Great Queen-street, Kingsway, W.C., Mr. Arthur Edmunds presiding.

London Hospital.—A post-graduate course for former students of the hospital only will be held from Oct. 11th to 14th inclusive. The old students' annual dinner will be held on Thursday, Oct. 12th, at the Trocadero Restaurant, Shaftesbury-avenue, W., at 7.30 for 8 P.M. The chair will be taken by Dr. P. N. Panton, director of the Hale Clinical Laboratory.

Middlesex Hospital.—The winter session will be opened in the Queen's Hall, Langham-place, W., on Tuesday, Oct. 3rd, at 3 P.M., when Prof. E. C. Dodds, director of the Courtauld Institute of Biochemistry, will deliver the introductory address on Diet, Exercise, and Weight, and Sir Holburt Waring, president of the Royal College of Surgeons, will distribute the prizes. A "refresher course" for former students of the hospital only will be held from Sept. 29th to Oct. 3rd. On Tuesday, Oct. 3rd, the annual dinner will be held at the Savoy Hotel (Embankment entrance) at 7.30 P.M.

Royal Free Hospital.—On Monday, Oct. 2nd, at 3 P.M., Sir Farquhar Buzzard, regius professor of medicine in the University of Oxford, will deliver the opening address and distribute the prizes at the London (R.F.H.) School of Medicine for Women. The annual dinner will be held on Thursday, Dec. 7th.

St. Bartholomew's Hospital.—The old students' dinner will be held in the great hall of the hospital on Monday, Oct. 2nd, at 7 for 7.30 P.M. Lord Horder will be in the chair, and the guest of the evening will be Mr. Ramsay MacDonald.

St. George's Hospital.—The prize distribution will be held on Monday, Oct. 2nd, when Dr. James Collier will deliver an address on Fashion in Medicine. A post-graduate course for former students of the hospital is being held from Sept. 29th to Oct. 2nd. The annual dinner will take place on Monday, Oct. 2nd, at 7.15 for 7.45 P.M., at Claridge's Hotel, W. Dr. Henry Robinson will be in the chair.

St. Mary's Hospital.—A week-end post-graduate course, open to all medical practitioners without fee, will be held from Sept. 29th to Oct. 1st in the library of the Old Medical School. The annual dinner of past and present students will take place at the Trocadero Restaurant, W., on Saturday, Sept. 30th, at 7.30 P.M., when Dr. Reginald Miller will be in the chair.

St. Thomas's Hospital.—A short post-graduate course for former students only will be held between Sept. 25th and Sept. 29th. The old students' dinner will take place at the Dorchester Hotel, Park-lane, W., at 7.15 for 7.45 P.M. on Sept. 29th, Dr. Charles Box presiding.

University College Hospital.—On Monday, Oct. 2nd, at 3.15 P.M., in the library of the medical school, Prof. A. E. Boycott will deliver the opening address. The annual demonstrations for old students will take place on Oct. 12th and 13th. The annual dinner will be held at the Hotel Victoria, Northumberland-avenue, on Oct. 13th at 7.15 P.M.

Westminster Hospital.—On Monday, Oct. 2nd, at 3 P.M., the winter session will be opened in the board room of the hospital, when Prof. W. Langdon Brown will give an inaugural address on The Return to Æsculapius, Sir Henry Hadow presiding. A short intensive post-graduate course for former students of the hospital will be given on Saturday and Sunday (Sept. 30th and Oct. 1st). The annual dinner of past and present students will take place at Grosvenor House, Park-lane, W., on Saturday, Sept. 30th, at 7 for 7.30 P.M., Dr. Eric Gandy will preside.

Royal Dental Hospital.—Prizes will be distributed at the hospital on Friday, Oct. 6th, at 8 P.M., at a conversazione over which Sir Holburt Waring will preside. The annual clinical At Home will be held at the hospital on Nov. 25th, and the dinner of past and present students will take place on the same evening at the Trocadero Restaurant, Shaftesbury-avenue, W., when Mr. J. G. Turner will be in the chair.

Details of post-graduate courses will appear in our Medical Diary.

PRINCESS ELIZABETH OF YORK HOSPITAL FOR CHILDREN.—On Friday, Sept. 29th, at 8.45 P.M., Prof. D. F. Fraser-Harris will give a lecture on science and poetry at the hospital, Mr. John Johnson presiding.

PUBLIC HEALTH SERVICES

On the State of the Public Health[1]

THE provisional figure for the population of England and Wales at the April census, 1931, was 39,947,931, and the estimated mid-year population in 1932 was 40,201,000. Thus the improvement in mortality-rate is still managing to keep pace with the falling birth-rate, but stability of population requires a crude birth-rate of 19·5 per 1000, and the present rate is only 4·9, last year being again the lowest on record. The infant mortality-rate (deaths of children under 1 year per 1000 births) fell from 66 to 65. The five principal causes of adult death remain as usual: diseases of the heart and circulatory system head the list, followed by cancer, respiratory diseases, diseases of the nervous system, and tuberculosis. There has been no change in the chief causes of infant death: congenital conditions and premature birth, bronchitis and pneumonia, and diarrhœa and enteritis, but there has been a steady decline of recent years in the two latter groups. Sir George Newman points out that the enormous saving of infant life brings with it the further responsibility of preserving and stabilising the weakly and delicate children who now escape the early death which would have been their fate a generation ago. Suicide has again increased, and its prevention is another responsibility which all the social forces that aim to mould character must assume. There has been a very slight reduction in the number of persons killed in road accidents, but a 2 per cent. increase in the number of injured. During the year a total of 27¼ million weeks' work was lost to the nation by sickness or disablement, as shown by the figures of the approved societies. Over 13 million pounds was disbursed in benefits.

INFECTIOUS DISEASES

The decline in small-pox, scarlet fever, tuberculosis, and diphtheria has been maintained, while cerebro-spinal fever and poliomyelitis tend to increase. Two cases of post-vaccinal encephalitis occurred, neither of them proving fatal. The intrathecal or intravenous injection of blood-serum from a recently vaccinated person is a valuable method of treatment which should be widely known, in order that it may be considered as soon as post-vaccinal encephalitis is suspected. Both the cases in 1932 were of the "dangerous age" for primary vaccination: school age or adolescent. During the epidemic of measles in London an investigation was made into the value of convalescent serum in the protection of contacts. The result was that three times as many inoculated children, compared with the control group, escaped the infection. Of the inoculated only 3 per cent. had an unmodified attack, while the corresponding figure in the uninoculated group was 70·5. The only ill-effects were a transient erythema or pyrexia. The preventive dose for children under 3 was 10 c.cm.; for older children the number of years multiplied by 4 c.cm. There is also some reason to believe that broncho-pneumonia in measles may be averted or modified by the timely administration of moderately large doses of potent antiscarlatinal serum.

Whooping-cough is still an important cause of child death, especially among girls. The figures seem to suggest that recovery from an attack is especially associated with physical fitness; country children do better than town children. A factor in whooping-cough that is not always remembered is the psychological trauma produced by terrifying spasms, accompanied by the feeling of suffocation. Experiments are being made with vaccines, but at present no absolutely reliable one is available.

The diphtheria of 1932 was on the whole mild. The office committee of the Ministry, which was appointed in 1931 to deal with immunisation and other cognate subjects, has issued a memorandum[2] to medical officers of health pointing out the desirability of offering all parents the facilities for artificial immunisation and giving details of procedure. A considerable stimulus to the work has resulted.

During the year there were 2545 cases of enteric compared with 2276 in 1931 and 2952 in 1930. The Malton and Denby Dale outbreaks emphasised again the risk of organic impurity in domestic water-supplies, and the report urges on local authorities the vital importance of protecting their water by periodic survey of sources and bacteriological examination of supply. It is now more than two years since the Epping outbreak ceased, but *B. paratyphosus* can still be recovered from the sewage effluent. A few sporadic cases, perhaps weeks apart but recurring year by year, may be associated with a polluted water-supply and disappear with the establishment of a pure one. A certain mental hospital in Yorkshire had "endemic" typhoid from 1908 to 1917, when an outbreak was investigated by a medical officer who insisted on a new water-supply. Thereupon the incidence ceased. Yet in all those years only about a dozen clinical cases had appeared in a population of 2000. Early diagnosis is the most important factor in preventing an outbreak, and Sir George Newman doubts if the amelioration in the clinical character of enteric fever has been properly appreciated; every case of continued pyrexia with indefinite physical signs should, he says, be provisionally regarded as one of the enteric group. All outbreaks entail for a time the presence of carriers in the population, but the fæcal carrier, under good modern sanitary conditions, is far less of a menace than the carrier of droplet infection. The most satisfactory policy at present seems to be to instruct any identified carriers in sanitation and require them not to prepare food or drink for others until they cease to carry bacteria.

The 1932–33 influenza epidemic was very widespread, but not of unusual virulence. No case of psittacosis was reported, though the disease may exist unsuspected in British aviaries, and anomalous cases of influenza, enteric, or pneumonia should suggest inquiries in this connexion. Only three cases of malaria were verified in 1932, but there were 11 cases of anthrax, three fatal. One of the non-fatal cases was contracted from the cuffs of a fur coat, sent as a present from Palestine. Epidemic encephalitis seems to be disappearing but poliomyelitis remains important. Opinion is still divided as to the value of convalescent serum in poliomyelitis. Animal experiments have proved definitely that under certain conditions the convalescent serum can neutralise the virus; it can be obtained free from the L.C.C. Western Hospital. The value of serum in cerebro-spinal fever has also been studied. The first dose should be as large as possible: 20 to 40 c.cm. intrathecally, and in some cases prompt treatment means the difference between life and death. The

[1] Annual Report of the Chief Medical Officer of the Ministry of Health for the year 1932. H.M. Stationery Office. Pp. 266. 4*s*. A leading article on one aspect of this report appeared in our last issue (p. 657).

[2] Ministry of Health Memo. 170/Med. H.M. Stationery Office. 1*d*.

incidence of the disease was above normal in 1932 and does not seem to be diminishing.

MATERNITY AND CHILD WELFARE

There were 2587 deaths directly due to child-bearing in 1932, but although the rate from sepsis was slightly less than in the previous year, the rate for other causes was higher than it has been since 1928. The report of the Maternal Mortality Committee, published in August, 1932, received prompt and widespread attention, and the action taken was unusually rapid. The training of medical students and midwives was revised, and the confidential inquiries into maternal deaths, made by the Committee, are being continued by the Ministry. One result of the inquiry is a free discussion which would have been impossible a few years ago; voluntary bodies are doing valuable work in propaganda and teaching.

At the end of 1932 there were 1060 antenatal clinics maintained by local authorities, an increase of 65 during the year. In 35 large towns and boroughs more than half the pregnant women attend these clinics, and in only seven towns were the attendances less than 20 per cent. of the notified births. Thus these clinics are becoming steadily more popular. It is important that they should not become crowded, as an essential part of their work is individual attention and instruction, and a general study of the mother's health, nutrition, and environment. The 2708 health visitors paid 450,179 visits to expectant mothers in their homes during the year. The transfer of poor-law institutions to local authorities supplied a large amount of actual or potential maternity accommodation, and the women are showing no reluctance to avail themselves of it. A municipal maternity service is thus growing up alongside the service under the Maternity and Child Welfare Act, and the two should be speedily unified. The practice of postnatal care is also spreading.

TUBERCULOSIS AND VENEREAL DISEASE

The bulk of tuberculosis patients come from the insured population, and the general practitioner therefore forms the first line of defence. "Why is it," asks Sir George Newman, "that all too often he halts in the delivery of the case?" In answer he gives four reasons: the disinclination of the patient to go to the practitioner; the physical concealment or obscurity of the disease in its early stages; some failure in diagnosis owing to lack of skill and experience or of facilities; and the lack of an active relationship between the practitioner and the tuberculosis officer, who should be adviser, consultant, and clearing-house. Greater coöperation between practitioner and public health officer is declared by the report to be one of the most urgent of all public health problems. The number of deaths from tuberculosis in 1932 was 33,658, the lowest rate on record and a substantial improvement on 1931. The decline was especially marked in pulmonary tuberculosis, perhaps on account of the absence of serious influenza and also of climatic conditions. The decline in non-pulmonary tuberculosis is remarkable; it has amounted to 37 per cent. in the last ten years. The number of new cases notified is also the lowest on record.

The importance of contact examination is being increasingly recognised, as large numbers of new cases are found by investigating the contacts of each known case. This measure is put in the forefront of prevention. In some areas special attention has been paid to the removal of infants and children from the infected homes: the "Grancher system," particularly favoured in France. In Salop the baby born to a tuberculous mother is sent at once to the county home for ailing babies, where it is kept under open-air conditions for a year. Meanwhile the mother completes her sanatorium treatment. At the end of the year the parents are persuaded if possible to send the child to relatives or to a public assistance institution. The system, however, is deemed unlikely to find much favour in this country. The re-housing of tuberculous families is also receiving attention. Insufficient discrimination seems to be exercised in the selection of intermediate stage adult patients for prolonged sanatorium treatment, while many children are labelled tuberculous on insufficient evidence. The Committee on Local Expenditure calculate that £60,000 to £80,000 a year might be saved if attention were given to selection and diagnosis. The machinery for exercising wise economy of the taxpayers' money has already been set up by the Ministry, and the recommendations of the Committee deserve the careful attention of local authorities.

There were 188 venereal disease treatment centres at the end of the year, varying in size from one which dealt with 4 cases to another which had nearly 10,000. There are strong grounds for believing that the centres deal with the great majority of the new syphilitic infections, and the figures, which show a decrease in new cases, may represent a genuine decrease in the incidence of syphilis, as relatively few sufferers nowadays can afford private treatment. Patients tend more and more to apply for treatment in the primary stage, at a time when the disease can be eradicated at much less cost and with much less danger to others. Cases of congenital syphilis seem to be too often neglected until the child reaches school age or serious disabling consequences have supervened. More coöperation between the venereal and school medical and child welfare services is needed. Too many syphilitic women attend for treatment during pregnancy and then, having an apparently healthy child, are seen no more.

Gonorrhœa shows little decline, and the report emphasises again the importance of having every kind of vaginal discharge examined as soon as possible. Far too few infected women seek treatment, and far too many cease attendance before completion of treatment. Education of the public in venereal disease problems is still urgently required.

NUTRITION

As fresh knowledge accumulates about nutrition the complexity of the subject becomes increasingly apparent. Healthy and complete nutrition is something infinitely wider than the mere stoking of an engine; it requires a healthy body; it is part of the sum total of sound physiological being. Nutrition, like malnutrition, is a process, not a state. Nevertheless, at the present time, scientific knowledge stands far ahead of practice, and the national capacity for work and output is impaired by unsatisfactory nutrition. The adequate nourishment of the child is one of the primary functions of the home; the appropriate nutrition of the adult is largely a matter of the common sense of the well-informed individual.

A diagram in the report shows that the adulteration of food has been steadily reduced, but this only deals with cases which can be brought to court; there has grown up at the same time a custom known as sophistication. Every firm now employs a chemist, and every sort of artifice is being used to improve the appearance, colour, taste, and keeping qualities of food. Many of the methods used are open to serious question; they seem capable of gradually affecting the digestive and metabolic functions and becoming

a contributory cause of lowered vitality, impaired physique, debased nutrition, or indifferent health. It is hard for the physiologist to say what will be the ultimate effect of exposing foodstuffs to ultra-violet rays or insecticide gases, of adding vitamins or of introducing synthetic colourings and flavours. Food may be so treated as to give a totally false impression of its nutritive value. Stored butter can be made to appear fresh by adding diacetyl which may have some destructive effect on the A-vitamin; bleaching of flour may involve the destruction of carotene; "egg-powder" may contain no egg whatsoever, though suggesting artificially the rich yellow colour which carotene gives to the natural yolk. Bread is a highly unsuitable vehicle for vitamin D, but bakers may soon be adding irradiated ergosterol to their product so universally that it would be impossible to obtain plain bread. The report foresees a real danger from the uncontrolled "scientific" sophistication of food.

The importance of milk can hardly be over-estimated, and in some ways there has been steady and even remarkable advance. The ordinary milk-supply has been enormously improved in a generation, although the problem of tuberculosis remains unsolved. Not less than 40 per cent. of milch cows are more or less infected, and 1 to 2 per cent. of them yield tuberculous milk. The general average of tuberculous milk in towns is about 7 per cent. The incidence of tubercle among cattle can be reduced, but not eradicated, by such measures as slaughter and testing. The report regards pasteurisation as the one prompt and safe method of protection. In London about 90 per cent. of the milk is pasteurised already, and the experience of the trade does not show that pasteurisation leads to neglect of sound dairying; it is not safeguarding dirty milk but ensuring the safety and keeping power of good milk.

Tuberculosis in Wales

Since the early days of the collection of national statistics, Wales, in company with England and Scotland, has experienced a nearly unbroken fall in its death-rate from tuberculosis. This observation, so satisfactory to the public health and social worker, is based, it will be observed, upon an average, the average death-rate in the principality, and like all averages it conceals the equally important variation beneath. Study of this variation quickly reveals a less satisfactory position. For instance, in the years 1926–30 the average crude death-rate from respiratory tuberculosis in England and Wales was 789 per million; in the counties of Cardigan and Caernarvon it was, for the same period, 1224 per million, or half as high again as the rate for the whole country. By further analysis it may be shown that this excessive rate of mortality is still further concentrated upon particular areas. For example, in the rural district of Gwyrfai (Caernarvon) during the ten years 1921–30 there were 571 deaths from tuberculosis, or 2450 per million of its small population (roughly 24,000); in the urban district of Pwllheli there were 64 deaths from tuberculosis, or a rate of 1720 per million. Such enormously high rates, two and a half to three times the normal, obviously demand investigation from the point of view of the epidemiology of the disease as well as from that of prevention.

The results of a study of some of these "black spots" has recently been made by Dr. Herbert Chalke for the Welsh National Memorial Association.[1] His account of a few selected areas, including the rural district of Gwyrfai—and in detail two of its villages—does not make very encouraging reading. For instance, of Gwyrfai he says that the district is mountainous with a heavy rainfall and much mist and damp; the housing conditions are, in general, inferior to those usually met with in an industrial district—many houses have no through-ventilation (although there can be no question of a lack of space), are built on low-lying, damp land so that damp walls are common, and have the most primitive sanitary arrangements—in more than one village "fields, waste ground near the houses, and the banks of a stream were often used for dumping the waste matter"; many would be condemned as unfit if alternative accommodation were available. Observation and inquiry led Dr. Chalke to the conclusion that the diet, although usually sufficient in quantity, is often improper. Tea is consumed to great excess, fresh meat and green vegetables are lacking—in a rural area, where ample land is available, few of the houses have cultivated kitchen-gardens. The habits and customs of the people (in conjunction with the heavy rainfall) favour close contact in small living rooms and poorly ventilated vestries which provide many opportunities for the spread of infection. Intemperance is absent, but there is a lack of opportunity for suitable recreation in the open air, and intermarriage is common, which, Dr. Chalke says, ensures that the bedridden phthisical patient does not suffer from a lack of visits from his numerous relatives!

There is, therefore, no dearth of factors which may, each and all, be implicated as contributing to the phthisis incidence. To measure their relative importance is not an easy task. It would not be difficult to find English—and perhaps Welsh—villages whose inhabitants intermarry, live in inferior and insanitary houses, eat an unbalanced diet, and yet do *not* suffer from an abnormally high phthisis death-rate. This careful study suggests many practical measures which should be taken to improve the health of the population of the area; it can hardly be said to solve the epidemiological problem involved. A number of the observations reported certainly demand somewhat more consideration than has been given to them and some statistical evidence in their support. For instance it is stated that many females migrate "both to the towns of Caernarvonshire and to urban areas further afield where they seek employment as domestic servants, shop assistants, and nurses." This factor may well have an important effect upon the phthisis-rate of the young adults in the rural area. It is an old observation that the rural death-rates from phthisis at young adult ages often exceed the urban death-rates at the same ages. Migration is, with little doubt, the important factor, but two interpretations of its modus operandi are possible: (1) the young migrants contract phthisis in the urban environment and return home to die; (2) the young migrants are the "cream" of the rural population, physically and mentally, and the accession of such a select group lowers the death-rates in the towns while their departure leaves a subnormal group in the country districts, whose higher death-rate is not surprising. Perhaps both factors are normally operative. A laborious investigation of the point was made by Mr. A. Bradford Hill, D.Sc., for the Medical Research Council some years ago in the County of Essex,[2] the conclusion being in favour of the second hypothesis—that the migrants not only were physically select,

[1] Report of an Investigation into the Causes of the Continued High Death-rate from Tuberculosis in certain parts of North Wales, 1933. Pp. 103. From the offices of the Association, Westgate-street, Cardiff.

[2] Med. Res. Council, Special Report Series No. 95, 1925.

but mainly retained their superior health in the urban environment and did not return home to die of disease contracted in the town. Dr. Chalke, on the other hand, reports that "many of the females, who are of the young adult class, come from homes heavily infected with tuberculosis, and it is only too common for these girls to break down under the strain of town life. They return home with active tuberculosis. Particulars of numerous cases of this nature have been obtained." Perhaps this is true only of a limited area; certainly in recent years enormous numbers of Welsh girls, from all parts, have migrated to urban areas, so that the point is an important one. The effect of urban life upon their health needs far more careful inquiry than Dr. Chalke has been able to devote to it. His opinion is not that they contract tubercle in the towns, but coming from infected homes they break down under the changed conditions and the strain of occupation and the quiescent disease flares up.

A problem of prevention which he rightly stresses with regard to the non-migrating population is the attitude of the people themselves, a fatalistic outlook and an inherent pride being common traits. He points out that those tend towards concealment of the disease and put many obstacles in the path of those engaged in the antituberculosis campaign. Even to-day, examination by the tuberculosis officer is often refused, because his visit is believed to stigmatise the family. Thus the large number of cases which are, for these reasons, undetected and uncontrolled, form an ever-present storehouse from which infection emanates. Although few of the houses have facilities for the satisfactory isolation of consumptives, the number of patients who refuse the offer of institutional treatment is large. Intermarriage, as already pointed out, may increase these risks of infection. From the inheritance aspect, however, selected genealogical tables, from villages where but a few unrelated families exist, cannot be informative. Another factor of importance in the area is the occupational one. A large number of males are employed in various branches of slate-quarrying, and may be exposed to a silica risk. Dr. Chalke believes that this factor undoubtedly plays some part in maintaining the high phthisis death-rate, but that only more detailed evidence can determine whether it is an important part.

In his recommendations he stresses as by far the most essential the hygienic education and drilling of the patient and the family to prevent the dissemination and more particularly the direct transmission of tubercle bacilli. The replacing of defective cottages by modern houses will, no doubt, be a slow process, and the reform in the dietetic habits of the people still slower. Meanwhile, this report shows, there are no lack of problems to occupy the attention of the public health worker, although in considering such small areas the statistical basis is often too slender and the numerous factors too inter-correlated to allow definite conclusions to be reached with regard to causation, or to the relative importance of the factors incriminated.

Accommodation in Mental Hospitals

Almost all the reports received from public mental hospitals refer to the overcrowding of these institutions. In some cases patients from districts more than 100 miles away are received into already almost fully occupied hospitals. On purely humane grounds such transfers are to be deprecated; but even where no such arrangements exist many hospitals are too full. The admission-rate has been steadily rising since 1919, and though the last rise (despite the Mental Treatment Act and unemployment) is less large, it gives cause for considerable alarm from an administrative point of view. Fortunately intestinal infections and tuberculosis do not appear to be closely related to over-population, but influenza epidemics seem more prevalent in the worst crowded hospitals. The figures for Leicester City are typical. Whereas in 1922 the asylum population represented 1 : 353 of the borough population, in 1932 this figure rose to 1 : 279. In order to stave off this increasing demand upon beds the Lancashire county council decided, in 1931, to accommodate only certified cases. The policy has fortunately been reversed, and now 5 per cent. of the beds are available for voluntary patients. This figure is more generous than might appear, for the voluntary population is a more mobile one than the certified. A similar concern for accommodation is probably prompting the other authorities in whose areas few voluntary patients are received. The main cause for the increase in admissions is not clear. It is due in part to earlier willingness to transfer the mentally afflicted to suitable care, and less readiness to cope with him throughout the attack. But social conditions such as unemployment show little relation between their prevalence and their agency as a cause of mental disturbance.

There would seem to be a greater delay in the discharge of patients, a delay all to the good of the patient and to his home folk. Protests are sometimes made by individual members of the hospital committees, who say that the families of recovered or recovering patients are less willing to receive them owing to the risks of unemployment. Such statements are seldom well supported, but they contain probably a germ of truth.

In order to reduce the overcrowding many of the mental hospitals for 1932 mention new blocks opened or being erected, and the transfer of nurses from unsatisfactory old quarters in the main buildings to a new nurses' home, or the enlargement of one already existing. At West Sussex hospital, for example, a larger block for chronic patients, a villa for private patients, and an admission hospital have all been completed and occupied within 14 months. In addition a nurses' home has been built, and during the influenza epidemic the proportion of cases in the new home was less than amongst nurses living in the old building. The medical superintendent of the Cumberland and Westmorland hospital implores his committee for a new admission block, and pertinently compares the sums spent on the care of the insane with those spent on the care of the roads. In Cheshire the board of control have blessed an ambitious scheme for the building of an admission block and villas for 500 patients.

Similar expenditure on colonies for the mentally defective indirectly relieves the overcrowding of the older hospital; 100 such patients have recently been transferred from the Hertfordshire hospital, and in other areas similar but smaller changes are contemplated. The transfer of senile and quiet cases to the public assistance institutions is reported from several counties. One side of these proposals must not be overlooked in the anxiety to lighten mental hospital population, and that is the training of the mental nurse. Some of these transferred cases present senile physical disabilities that have afforded valuable general nursing experience.

Finally the boarding out of the mentally dull is a method used too little for lack of available information

about homes where such patients can be taken. Extension of this practice is desirable to familiarise the public with it, and to remove the misconception that a mental hospital is a prison in which the insane are kept for life.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 9TH, 1933

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 2 (last week 4); scarlet fever, 2370; diphtheria, 878; enteric fever, 60; acute pneumonia (primary or influenzal), 412; puerperal fever, 39; puerperal pyrexia, 122; cerebro-spinal fever, 17; acute polio-myelitis, 35; acute polio-encephalitis, 2; encephalitis lethargica, 7; dysentery, 25; ophthalmia neonatorum, 95. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 12th–13th was as follows: Small-pox, 13 under treatment, 0 under observation (last week 15 and 0 respectively); scarlet fever, 1747; diphtheria, 1460; enteric fever, 13; measles, 440; whooping-cough, 275; puerperal fever, 23 mothers (plus 11 babies); encephalitis lethargica, 253; poliomyelitis, 4; "other diseases," 177. At St. Margaret's Hospital there were 18 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London, there was no death from small-pox, 1 (1) from enteric fever, 4 (1) from measles, 7 (1) from scarlet fever, 13 (1) from whooping-cough, 19 (5) from diphtheria, 103 (17) from diarrhœa and enteritis under two years, and 12 (1) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa outside London, 17 were reported from Liverpool, 7 from Birmingham, 6 from Sunderland, 4 each from Portsmouth, Bristol, and Leicester, 3 each from Acton, Leeds, Nottingham, and Stoke-on-Trent. Birmingham reported 3 deaths from whooping-cough. Five deaths from diphtheria occurred at Liverpool, 3 at Leeds.

The number of stillbirths notified during the week was 249 (corresponding to a rate of 39 per 1000 total births), including 48 in London.

SPECIAL ARTICLES

PROBLEMS OF MEDICAL PRACTICE IN AMERICA

(BY A SPECIAL CORRESPONDENT)

III.*

THE Committee on the Costs of Medical Care were unable to present a unanimous report, which is not surprising in view of the size of the Committee and the variety of the interests represented upon it. At the time of reporting (October, 1932) the Committee had 48 members; nine members signed a minority report, which may be taken as expressing the views of the American Medical Association; there is a second minority report signed by two of the dental members of the Committee, and there are two individual statements of dissent. Moreover, there is some divergence of opinion among the signatories of the majority report and the main minority report: eight of the former and two of the latter declare themselves in favour of compulsory health insurance, although the recommendations of both reports are against it.

THE MAJORITY REPORT

The majority report is based on two conclusions reached by the Committee from the evidence collected by them: (1) that many persons do not receive the medical care they need, or receive it at rates which for them are excessive; (2) that many persons who give the care receive inadequate remuneration. The majority see the remedy in the organisation of both "producers and consumers." They recommend that the persons giving medical care should be so organised that the medical unit should not be an individual practitioner, but a group of practitioners, and that the persons receiving medical care should voluntarily form groups uniting to make periodical payments into a common fund, from which the costs of any treatment required by a member of a group would be defrayed. In other words, the remedy of the majority is group practice and voluntary health insurance.

GROUP PRACTICE.—Dealing first with the organisation of medical services, the majority recommend as the "keystone of the concept of a satisfactory medical service for the nation" the development in cities of not less than 15,000 population of one or more non-profit "community medical centres":

> "This centre would include a well-equipped general hospital, an out-patient department, and a pharmacy. It would provide offices for physicians, dentists, technicians, and subsidiary personnel, and headquarters for nurses. All facilities for the practice of modern scientific medicine would be available, such as X ray, laboratory and physiotherapy equipment, and a well-stocked library."

The centre would be under the administrative control of a lay board, similar to a voluntary hospital board, but the professional aspects of the service would be controlled by the professional personnel through an executive committee or chief officer. The patients would be given free choice of doctor, and "the rôle of the family practitioner would be prominent and respected." It is contemplated that nearly all the practising doctors and dentists in the areas served would eventually join the staff of a centre, and would be paid by the centre on an agreed basis, salary, capitation, or fee. The distinctive feature of such practice would be that each practitioner would be responsible to the group rather than to himself for the quality of his work. In towns too small to support a complete centre smaller units affiliated to the nearest centre would be established; and in the villages and rural areas, which contain about 38 per cent. of the population of the United States, there would be a series of "medical stations," each staffed by one or two doctors, a dentist, and a few public health nurses or nurse-midwives. The stations would be affiliated to centres, and would occasionally be visited by travelling specialists.

The majority contemplate also the continuance for some time of complete medical services provided jointly by employers and employees for the workers in an industrial undertaking or group of undertakings. They think such a service "embodies a desirable form of organisation for medical care if it is developed so that the participating professional men have control over the professional aspects of the service and opportunity and stimulus to maintain high standards," but they would prefer that eventually

* Parts I. and II. appeared in THE LANCET of Sept. 9th and 16th respectively.

all industrial medical services should expand into community medical centres. They contemplate also the extension of the health services which some American universities now provide for their students, and they attach special importance to the development of the public health services, central and local. The sum of $1 per head that the people of the United States now spend on public health services should, the majority think, be increased to $2 or $3 per head. They recommend that the work of the various centres and other agencies concerned with the provision of medical care should be coördinated by appropriate local and central bodies.

It will be seen that the recommendations of the majority report would bring about drastic alterations in the conditions of medical practice. Independent practice would for nearly all practitioners become a thing of the past. With a few exceptions the doctor would be the appointed member of a staff responsible to a professional chief. This would involve changes in practice far more important in their direct and indirect effects than those brought about in this country by the national health insurance scheme.

GROUP PAYMENT.—The majority recommend that the costs of medical care should be met by the use of voluntary insurance, aided where necessary by subsidies from taxation, which should not include the provision of cash benefits. They recommend that organised groups of consumers should pay agreed annual sums in weekly or monthly instalments into a common fund, and arrange with organised groups of practitioners to furnish the members of the groups and their families with complete medical care, which it is thought could be provided for about $1.50 to $3.25 per month per member, with rather lower rates for dependents. It is recognised that some persons would be unable to pay the full costs, and that the taxpayer may have to be called upon to supplement the payments of the low-income families. In sparsely populated areas or in those of exceptional poverty the local authorities should, it is recommended, employ salaried doctors to furnish general medical services to the residents of the area.

THE MINORITY REPORTS

The first minority report, which is signed by seven of the 17 private practitioners on the Committee, and by the president of the Catholic Hospital Association and the secretary of the American Medical Association, is in agreement with the recommendations of the majority with respect to the development of public health and medical education, but on the main recommendations—those relating to group practice and group payment—there is a fundamental difference of opinion. The minority feel strongly that the individual practitioner and not the group should be the unit in medical practice. The medical centre plan of the majority they regard as "the adoption by medicine of the technique of big business, that is, mass production," a technique that cannot be applied in dealing with problems so intensely personal and individual as those of medical diagnosis and treatment. They hold that in a group the general practitioner tends to disappear, and they think the general practitioner should take a place of paramount importance in medical practice. "The great majority of illnesses and injuries (about 85 per cent.) are of such a nature that they can be treated efficiently by any able general practitioner with very simple equipment." The minority contend that the medical centre would, besides impairing the position of the general practitioner, establish in every community a medical hierarchy which could dictate who might practise there; competition between the various centres would arise with unfortunate results on the quality of the service, and the continuous personal relation between doctor and patient could not be maintained. As for the staff of the centre, freedom of action, except for the heads of the group, would be "restricted in respect to vacation, study, travel, attendance upon scientific meetings, and even publication of medical articles, by the will of the chief or chiefs of the clinic." Industrial medical service the minority regard as still more objectionable, since it involves contract practice; and contract practice the minority think tends to degrade the medical profession by lowering its ethical standards and by encouraging unfair competition, inadequate remuneration of the doctors, and inferior medical service. For these reasons the minority are against the group payment, or voluntary insurance proposals of the majority. They think that if America must adopt a system of insurance it would be more sensible and logical to choose "the method to which European countries have come through experience, that is, a compulsory plan under governmental control." They are, however, opposed to any form of health insurance except under the restrictive conditions set out in the next paragraph.

The minority regard the main problem considered by the Committee as one of a number of general problems arising in a transitional stage of social development marked by increasing urbanisation and industrialisation and by radical changes in the standard of living—problems analogous to those "which caused great social and political unrest in the last decade of the last century and which were not settled until there was a general increase in wages to compensate for improvements in the standard of living." It seems a fair inference from their report that the minority think that with the return of prosperity existing methods of providing medical care will, with minor modifications, suffice for the general body of the community. But they feel strongly that the Government ought to give complete medical care to the indigent, who, they say, at the present time receive their care largely at the cost of the medical profession. They recognise also that for numbers of the poor who are not indigent some insurance method may be necessary, especially for the treatment of chronic illnesses, but they recommend that any method that may be adopted should fulfil the following conditions:—

"1. It must be under the control of the medical profession. (A 'grievance board' to settle disputes, having lay representation, is permissible and desirable.)

2. It must guarantee not only nominal but actual free choice of physician.

3. It must include all, or a large majority of the members of the county medical society.

4. The funds must be administered on a non-profit basis.

5. It should provide for direct payment by the patient of a certain minimum amount, the common fund providing only that portion beyond the patient's means.

6. It should make adequate provision for community care of the indigent.

7. It must be entirely separate from any plan providing for cash benefits.

8. It must not require certification of disability by the physician treating the disease or injury."

The minority think that the county medical society is the proper unit of organisation to carry out such a plan, under the supervision of the State and national societies.

There is a second minority report, of four pages

only, signed by two of the dental members of the Committee, which is in accord with the general recommendations of the majority in favour of group practice and group payment, but agrees with the minority in regarding the medical centre plan as utopian and involving many details too visionary and problematical to justify inclusion amongst the Committee's recommendations. They regret that the Committee's inquiries did not include a study of dental group practice, which they find is increasing in America, and they think a trial should be given to compulsory health insurance, which need not, in their view, "interfere with the highest professional standards nor with the close personal relationship between practitioner and patient." They are in sympathy with the county medical society plan of health insurance formulated by the minority, and conclude by suggesting that a national organisation should be formed to study group practice and define its standards.

It will be noted that the second minority report is favourable to the introduction of compulsory health insurance into America, but the signatories of the other reports are opposed to it, though, as already pointed out, they are not unanimous in that view. It does not seem, however, that the Committee have made an adequate study of the various methods of health insurance adopted in Europe. There is nothing to show they were aware of the tendency in compulsory health insurance to separate the cash benefit side from the provision of medical services, and that in several European countries, including Great Britain, the insurance societies have no concern with the administration of medical benefit; and the signatories of the minority report appear not to appreciate that in France and Norway medical care is provided for the insured population under conditions similar in many respects to those they recommend for adoption in any development of health insurance that may be necessary in America.

THE VALUE OF THE COMMITTEE'S WORK

To a European student of the majority and minority reports and the documents on which they are based, the chief value of the Committee's output lies in the wealth of facts collected on the conditions of medical practice in America, and in the clear presentation of the important issues arising from consideration of the facts. On the constructive side both reports are disappointing, regarded as the results of five years' intensive study by so distinguished a body of workers. As to the majority report, many European readers will be inclined to share the view expressed by Mr. Edgar Sydenstricker in his short statement of dissent that the recommendations do not "deal adequately with the fundamental economic question which the Committee was formed primarily to study and consider." The facts presented by the Committee show that the question presses urgently for solution, calling for measures that could be made operative in the near future. But the majority put forward a scheme which they contemplate will require some 25 years for fulfilment. The minority's solution seems still more inadequate. They appear to regard the problem of making proper provision for medical care as one which tends in large measure to solve itself; at all events, their summary dismissal of it on page 182 of the report suggests that they are content, in words used by Mr. Dooley in connexion with another important problem, to "turn the job over to Destiny."

The Committee on the Costs of Medical Care have, however, performed a service of great importance both to the medical profession and to the public by their clear setting out of certain questions upon the answers to which the position of the profession in a modern community will depend. Of these the most important is whether medical practice should be carried on by individual independent practitioners or by groups of practitioners responsible to a superior authority. Beside this the related question whether medical services should or should not be paid for on an insurance basis is of secondary consequence. The Committee's researches have thrown a flood of light on these questions, and their reports deserve to be widely read and carefully considered.

PARIS

(FROM OUR OWN CORRESPONDENT)

THE LATE PROF. HAYEM

THE death of Georges Hayem removes a familiar landmark in French medicine. He was one of the most prominent personalities in the Academy of Medicine, to whose discussions he often contributed the saving grace of a mature intellect. He was born in Paris in 1841, and his professorial career began while he was still comparatively young. In 1879 he held a chair of therapeutics. Later he was professor of clinical medicine at Saint-Antoine, where his ninetieth anniversary was recently celebrated. He became a member of the Academy of Medicine in 1886, and was elected its president in 1918. The range of his scientific attainments was wide; the association of his name with diseases of the stomach and blood reflected only two of many interests. He combined the acumen of the successful clinician with the precision of the laboratory worker, and in both fields he has left his mark.

THE INDISPENSABILITY OF THE SANATORIUM

The sanatorium has of late been the subject of much inexpert criticism here as in other countries. It is true that the latest sanatoriums have cost a pot of money. It is also true that in tuberculosis the greatest therapeutic advances made in the last generation have been surgical. But neither of these considerations nor any of the other quasi-plausible objections to the sanatorium would seem to justify its sabotage in the campaign against tuberculosis. A recent discussion in the Academy of Medicine have done much to quash the anti-sanatorium agitation. Those who contributed to the discussion were acknowledged leaders in the medical profession, and the unanimity shown on the subject was striking. The only criticism voiced was one of detail rather than principle. It was urged that in trying to save their patients' lungs sanatorium physicians were apt to ignore their digestive tracts. This only by the way. The ball was started rolling by no less an authority than Émile Sergent. It was taken up in succession by Léon Bernard, Bezançon, Paul le Gendre, and Rist. As Sergent pointed out, it was as lately as 1919 that the Honnorat law imposed on every department the obligation of providing a public sanatorium. Since then the belief has taken root that the sanatorium is but a legend, a souvenir, a myth, an antiquated conception to be abandoned. But he was sure the achievements of modern surgical technique would often be illusory were it not for the supplementary aid of sanatorium treatment. Bernard spoke in the same sense, deprecating the tendency in certain high quarters to place faith in the cheap short cut to recovery. Le Gendre focused

attention on the educational rôle played by the sanatorium, which not only turns out patients taught to prevent the infection of others, but also physicians schooled in the psychological requirements of the patient, as well as in the modern technique of collapse and other therapy. Rist, in his turn, emphasised the value of the sanatorium as a much needed bulwark against the quack. In France his name is legion. He assures the patient that he can be cured without taking rest, without ceasing work, and while still making money. The quack is to be met by facilitating the entry of the patient to a sanatorium with the minimum of delay.

"WE SHALL END IN PRISON"

A provincial surgeon, in a letter to the *Concours Médical*, gives chapter and verse in support of the rather dismal prognostication with which he heads his communication, "Nous finirons . . . en prison." Not only do his patients refuse to pay his fees but they seem to revel in bringing actions against him for malpractice and other lapses from what they consider nice behaviour. In March last year a woman asked to be confined in this surgeon's clinic. She had no means nor social position, and he undertook to admit her only after her "protector" had undertaken in writing to pay her hospital and operation expenses. When, a year later, the matter came into court the surgeon lost his case because the name of his clinic had not been specifically mentioned. Three years ago this same surgeon operated in her home on a woman for retention of a dead fœtus. She returned to work a few days later. After four months a severe hæmorrhage occurred, and she was admitted to a hospital where she was curetted. It was intimated to her by the operator that if she had been in danger it must have been because the original operation had been incomplete. The woman not only refused to pay the surgeon's fee but was also prepared to sue him for damages. She was bristling with affidavits. The surgeon decided that discretion was the better part of valour, and the affidavits were exchanged for a receipted bill. On a third occasion this same surgeon attended at his clinic the victim of a road accident. The main blood-vessels of the injured leg being intact he tried to save it. Unfortunately, two days later, signs of infection having developed, he had to amputate it. Two years later the conical stump was operated on by another surgeon who commented unfavourably on its genesis to the patient, who not only refused to pay his first surgeon's fees but is now suing him for 150,000 francs. The provincial surgeon who recounts these misadventures states that the medical profession seems to be the subject of a more or less latent hostility on the part of legal authorities, and he traces this attitude back to student days, with the ranks of the medical student recruited for the most part from the have-nots and the law students from the well-to-do. In an editorial note on this letter it is pointed out that in 90 per cent. of the actions brought against medical practitioners the careless and often uncharitable remarks of another doctor constitute the basis of the action.

MEDICINE VERSUS ALCOHOL

The revenue derived from alcohol in France is considerable. So is the antagonism of the medical profession to it. Recently the authorities decided to license 2000 new public houses (*débits de boissons spiritueuses*). Whatever the reasons for this step the medical profession, as represented by the Academy of Medicine, has been prompt in trying to arrest it. At a meeting of the Academy a resolution was unanimously adopted protesting vigorously against this step. Only a few months earlier the Academy was the scene of a similar protest, this time against propaganda in favour of alcoholic beverages in school primers.

CENTENARY OF A BENEVOLENT SOCIETY

Recently the Association des Médecins de la Seine celebrated its centenary in the large amphitheatre of the faculty of medicine in the presence of the President of the French Republic. The founder of this body was a Spaniard, Dr. Orfila, who became a naturalised Frenchman. He was the doyen of the faculty of medicine in 1833, when he founded the Association and became its first president. He held this position till his death in 1853, although in the interval his political views had led to his persecution by the authorities. Many distinguished members of the medical profession have subsequently presided over the activities of this Association, which began with a capital of 7000 francs and now disposes of more than four million francs. The interest from this sum is devoted to aiding destitute members of the medical profession and their families.

IRELAND

(FROM OUR OWN CORRESPONDENT)

THE HOSPITALS SWEEPSTAKES

Lord Powerscourt, Chairman of the Associated Hospitals Committees had important interviews lately with Mr. De Valera and with Dr. C. Ward, Parliamentary Secretary to the Department of Local Government and Public Health, concerning the intentions of the Government with regard to the sweepstakes. Dr. Ward assured Lord Powerscourt that the Hospitals Commission would be set up immediately, and that it would investigate all claims and report as soon as possible. It was the aim of the Government to establish a system whereby waste and overlapping of work would be reduced, and a well-thought-out scheme of coördination introduced. The Government wished to obtain the maximum of free beds for the sick poor. It was not intended to delay the distribution of the funds longer than was necessary to attain these objects. The Government has invited the five gentlemen who have hitherto acted as trustees for the sweepstakes funds to act as National Trustees. They are: the Earl of Granard, Lord Holmpatrick, the Right Hon. T. K. Laidlaw, Mr. Edmond McGrath, and Mr. H. Monahan.

THE LATE DR. E. T. BLAKENEY

Edmond Thomas Blakeney died recently in Dublin at an advanced age. Born in County Roscommon, he took the licences of the Royal Colleges of Dublin in 1869. Having practised for some years as dispensary doctor at Boyle in his native county, he was appointed surgeon to the Roscommon County Infirmary, and he fulfilled the duties of that office for 46 years until his retirement a few years ago. Working in a lonely district, far from any scientific centre, Blakeney kept in touch with modern surgery to a surprising degree. He was one of the first surgeons in Ireland to realise the practical uses of X rays, and even up to the date of his retirement he performed the most modern operations. He was held in great respect both by the public and by his professional brethren through the province of Connaught. Although in busy surgical practice, Dr. Blakeney found time to take part in the sport of the county, and was for several years master of the Roscommon Harriers.

THE PREVENTIVE ASPECT OF DISEASE

COURSE AT KING'S COLLEGE HOSPITAL

A COURSE of medical lectures, emphasising the preventive aspect of disease, will be given at King's College Hospital medical school at 4.30 P.M. on Thursdays during the coming session. This innovation is welcome in view of the wide ground covered by the syllabus (set out below), and the careful choice of exponents of each aspect of preventive medicine. It is of interest that of the lecturers eight are past or present members of the staff of the hospital. Those invited from outside include the chief medical officer of the Ministry of Health and four of his colleagues at the Ministry or at the Board of Education, the senior medical officer of the Home Office, a medical coroner, and well-known teachers in other schools of the University of London.

1933.
Oct. 5. Sir George Newman: Introductory Lecture.
,, 12. Sir Leonard Hill: Ventilation, Sunshine, and Clothing.
,, 19. Dr. R. P. Williams: Water-supply in Relation to Disease.
,, 26. Mr. W. Gilliatt: Prevention of Maternal Mortality.
Nov. 2. Prof. G. F. Still: Prevention of Diseases in Infancy.
,, 9. Dr. W. P. H. Sheldon: Prevention of Diseases in Pre-school Age.
,, 16. Dr. J. A. Glover: Preventable Diseases of School-children.
,, 23. Dr. C. B. Heald: Value of Sport and Exercise in Prevention of Disease.
,, 30. Dr. R. D. Lawrence: Diet and Dietaries.
Dec. 7. Dr. R. A. McCance: The Rôle of Vitamins in Health.
,, 14. Dr. J. M. Hamill: Milk.

1934.
Jan. 11. Prof. R. Tanner Hewlett: Prevention of Diseases conveyed by Food.
,, 18. Prof. Major Greenwood: Epidemiology and its Lessons.
,, 25. Dr. A. J. R. O'Brien: Control and Prevention of Infectious Diseases.
Feb. 1. Dr. F. J. Poynton: Prevention of Rheumatism.
,, 8. Dr. A. S. MacNalty: Prevention of Tuberculosis.
,, 15. Sir Charlton Briscoe: Prevention of Respiratory Affections.
,, 22. Dr. J. C. Bridge: Prevention of Occupational Disease.
Mar. 1. Dr. S. A. Kinnier Wilson: How to live the life of Modern Times.
,, 8. Dr. A. Douglas Cowburn: Preventive Medicine and the Law.

These lectures are free to all practitioners as well as to students of the hospital.

MEDICINE AND THE LAW

Herbalist and Registered Practitioner

AN inquest was held at Walthamstow last week upon the death of a 12-year-old girl who had been treated by a herbalist. The latter, Prof. G. C. Foster, of Forest-road, Walthamstow, gave evidence of having prescribed for a cold. Later, thinking the patient was in an extreme state of debility and possibly of exhaustion, he advised the parents to call in a registered medical practitioner. Though Prof. Foster repudiated the suggestion, the coroner seems to have taken the view that the advice to the parents was due to a desire to obtain the services of someone who could sign a death certificate. The coroner observed that unregistered practitioners who treat a patient until life is in danger and then bring in a registered practitioner for the purpose of getting over the difficulty of death certification are infringing the spirit of the Medical Acts. As, however, the Acts enable unregistered persons to practise, it is hard to see how their spirit was in this case infringed. Another point which sometimes arouses comment is the use of the title or description "Professor." The word ordinarily suggests the occupancy of an academic chair at some accepted university or college. Prof. Foster may have this qualification, but other unregistered persons undoubtedly adopt the title, to the confusion of the public, with insufficient justification. The Medical Act, which forbids the unauthorised use of such titles as "physician" and "surgeon," has of course no concern with the title of "professor." The sponsors of the proposed legislation against spurious university degrees will perhaps consider whether their Bill might not be extended to cover non-existent professorships.

At the Walthamstow inquest Dr. O'Kelly described the result of his post-mortem examination of the dead child. Death was due to pericarditis and blood poisoning. He found nothing to justify the view that anything more might have been done for the child. The coroner recorded a verdict in accordance with the medical evidence.

PANEL AND CONTRACT PRACTICE

The Unemployed Person and his Friends

THE annual conference of representatives of local medical and panel committees, which is to meet at B.M.A. House on Thursday, Oct. 19th, will no doubt discuss the prolongation of insurance for unemployed persons. The reply of the Government to a deputation from the Insurance Acts Committee was that the law could not be held to justify putting pressure on local authorities to substitute a panel system for the present system of medical relief. The Ministry were prepared to agree to the introduction of the open-choice method in cases where the authority itself wished to make the change. They were not disposed however to create a limited privileged class amongst those entitled to medical relief, the capitation payment for whom could not be placed on insurance funds, and the present situation precluded the possibility of throwing the charge on the Exchequer. In this matter there seems to be a difference of opinion between insurance committees and approved societies. A pamphlet by the Federated Association of Insurance Committees for England, Scotland, and Wales sets out the arguments for the continuation of these unemployed persons in medical benefit. The Association point out the anomalous situation created by allowing re-entry into insurance only after eight weeks' employment in any half year, whereas persons other than this particular class become entitled to medical benefit on payment of their first contribution on entry or re-entry into insured employment. They estimate the number of insured persons who will go out of insurance at the end of 1933 as likely to exceed 100,000; to hand over to poor-law medical officers the treatment of this mass of able-bodied unemployed persons is not, they feel, in accord with the public policy which dictated the Local Government Act of 1929. To continue these (100,000) people in medical benefit at (say) 12*s*. a head would cost £60,000. To find this money four methods are suggested:—

1. The Government, by cutting down their contributions to benefits from two-ninths to one-seventh in the case of insured men, and to one-fifth in the case of insured women, has saved some £2,800,000 a year; and a further £800,000 mostly from the 10 per cent. deduction from the doctors' capitation fees. There should be no difficulty therefore in finding £60,000.

2. A small adjustment of the central fund, or alternatively a postponement in the redemption of reserve-values, might enable insurance funds to meet the cost.

3. Public assistance authorities might be invited by the Minister to make a contribution to meet the cost. This being a national rather than a local matter, treasury grants to the authorities might be augmented if this suggestion were adopted.

4. Some combination of these methods.

In one way or another the Association insist that the maintenance of these persons in the insurance scheme should be definitely secured, a policy held to be in harmony with public sentiment, which is opposed to the transference of sick persons to the poor-law medical service just because they are unemployed. On the other side is Sir Thomas Neill, who in another memorandum seeks to show that no one who does not contribute can share in an insurance scheme. But although the funds of approved societies may be dangerously low, the officials generally do not strongly support Sir Thomas.

We might point out that there are three sources from which the money comes: Government, employer, and employee. The approved societies seem apt to forget the first two, and especially the fact that it is the reduction of the Government contributions that has made the position of some societies so precarious. The employer's contribution has not been reduced. But when through no fault of his own the employee is no longer able to work, his approved society—his natural protector—begs the Government to turn him out, hand him over to the poor-law, and thus get rid of an unprofitable member. Insurance committees have more consideration, and it is to be hoped they will even now persuade the Ministry to adopt their suggestions.

Effect of Unemployment upon the Panel Doctor

Dr. Theodore Craig (Dudley, Northumberland) writes: "According to the statistics of the Ministry of Health, some 600,000 insured persons will cease benefit on Jan. 1st, 1934, but, judging from the increasing lapses from panel lists in Northumberland and Durham, the local panel committees consider that this number will exceed one million. All these people, and their dependants, probably numbering another three million, will then become chargeable to the various public assistance committees. So far as can be ascertained at present, the Government has made no arrangements for providing any additional funds to enable these committees to meet the cost of medical attendance upon them. To the casual eye this would seem an excellent chance for district medical officers to increase their practices and to grow wealthy at the public expense, but the salaries of these officers remain on the scale fixed in prosperous days, long before the war, when pauperism was almost unknown. In the county of Northumberland, for instance, careful statistics have been prepared by the M.O.H., which prove that the 'fee per service rendered' varies between 3 guineas and 1¼*d*. In other words, district medical officers in areas where there is no 'distress' are adequately paid for such rare services as may be required, whereas D.M.O.'s in the really distressed areas are not.

"My own personal experience is that, prior to the general strike of 1926, my salary of £25 per annum as a D.M.O. actually produced a fee of nearly 2*s*. per service. Figures carefully kept for a period of over two years show that I have recently received rather less than threepence per service rendered. After the strike of 1926 I was asked by the local guardians to put in an account for extra work with a view to special consideration. I sent in an account, based on the minimum B.M.A. fees, which amounted to over £200. The guardians eventually sent me an ex-gratia cheque for £50. Since that time, I and many other D.M.O.'s have made numerous efforts to induce the public assistance committee to pay us a reasonable salary—i.e., something approaching 1*s*. 6*d*. per service rendered—but no reply has been received to our numerous letters. The county medical officer tells us frankly that no funds are available. What can we do?

"There is one other point which demands attention. When the insured person is compelled to seek medical attention for himself and his dependants from the D.M.O., he is, naturally, incensed at his own panel and family doctor, with the result that, should any members of the family still remain in insurance benefit, they wish to transfer their 'panel cards' to the D.M.O. This, very naturally, causes friction between the D.M.O. and his professional brethren, who accuse him of using his public appointment to feather his private nest. Hence the D.M.O. is liable to lose professional prestige. The only solution that I can see is to throw open the public assistance service to the general practitioner and allow every person free choice of doctor."

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Lt. J. H. Nicolson to be Surg. Lt.-Comdr.

The following appts. are notified: Surg. Comdrs. J. Wylie to *Norfolk*; T. Madill to Chatham Hospital; C. N. Ratcliffe to *Achilles*; and H. Hurst to *Exeter*. Surg. Lt.-Comdrs. G. S. Rutherford to *President*, addl., for Medical Depôt, Royal Victoria Yard, Deptford; and A. L. McDonnell to *Shoreham*. Surg. Lts. H. E. B. Curjel to *Kent*; and J. W. Caswell to *Sandwich*.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdrs. J. E. Purves to *Victory*, for Haslar Hosp.; E. E. D. Gray to *Malaya*; and K. A. Nicholson to *York*.

Surg. Lt. E. F. St. J. Lyburn is transferred to Sussex Division from Ulster Division.

ROYAL ARMY MEDICAL CORPS

Majs. T. B. Nicholls and J. B. Jones to be Lt.-Cols.

INDIAN MEDICAL SERVICE

Maj.-Gen. W. C. H. Forster, C.I.E., V.H.S., retires.

The prov. promotions of the undermentioned Majs. are confirmed: D. P. Bhargava and B. R. Tandon (on prob.).

Lt. (on prob.) B. A. Porritt to be Capt. (prov.) (on prob.).

ROYAL AIR FORCE

Flight Lt. L. P. McCullagh is promoted to the rank of Squadron Leader.

BROADCASTING TALKS.—On Friday, Oct. 6th, at 10.45 A.M., the first of a new autumn series of talks on child welfare will be broadcast. It is announced that they will be given by physicians who have made a special study of the needs and ailments of childhood. The first three, in October, will be devoted to antenatal clinics, and on Oct. 27th the first of several talks on diets will be given. A pamphlet has been prepared in connexion with these talks, which gives detailed advice on the planning of menus.

In the series entitled Some British Institutions, to be given on Wednesdays, at 7.30 P.M., on Nov. 15th, a medical officer in the public health service will describe some of the problems and difficulties of his work.

CORRESPONDENCE

A FATAL X RAY ACCIDENT

To the Editor of THE LANCET

SIR,—The coroner's inquest on the nurse who died suddenly at the Wimbledon Hospital while attending to a patient being X rayed was held in a very noisy road. Evidence was given and questions were asked in an undertone, and it is not surprising that some of the press accounts were inaccurate. I was present at the inquest but not at the accident; the following is an accurate account of what happened at the hospital as reported to me on my return from holiday.

An elderly woman, with a fracture of the neck of the left humerus in extension, was having a stereoscopic pair of skiagrams taken of her left shoulder region, in her bed, in the ward, with the ward trolley X ray set. The operator was an experienced radiographer who was doing locum for the regular sister. She did the same locum last year, and she is in the habit of doing locum work. She was well acquainted with the apparatus, which was in perfect working order (being overhauled regularly every quarter by the makers), and is of modern type such as is used in every hospital of sufficient size to need one. The apparatus was on the patient's left side near the foot of the bed. The house surgeon was standing at the head of the bed in contact with it. The nurse was in attendance on the patient, on the right side near the patient's right shoulder. The nurse was taking no actual part in the radiography. The apparatus was in position, and the current had been switched on twice, first to test the amount of current passing through the tube, and secondly, with the film in position, to make the first of the pair of stereoscopic pictures. The nurse appeared to be concerned about the position of a blanket covering the patient's shoulder, but was warned by the radiographer to "stand clear." She must still have displayed concern about the blanket, because the house surgeon also said in a sharp authoritative voice, "Don't touch. Leave the blanket alone." In spite of these clear warnings immediately beforehand she impulsively put her hand forward, after the exposure had begun, and, obviously coming too close to the high tension circuit, received the shock which killed her. Her movement in spite of warning is unaccountable, but that it was this movement which brought her within the danger zone is incontestable. The suggestion about the bed being insulated and possibly charged to a high potential was a red herring across the track of the inquiry. In the first place under the circumstances, with the properly designed plant that was used, it was impossible to charge the bed, and in the second place, had the bed been so charged the house surgeon, who was already in contact with the bed, must have felt the shock first. (And presumably the patient must have felt some shock when she and the bed were discharged, if such had been the case.)

Until satisfactory shock-proof apparatus of sufficient power is available it is difficult to see how X ray work in the wards is to be made proof against such a foolhardy action as took place on this occasion. Sharp-edged tools have to be used in many occupations, but the risks are negligible so long as the instructions of the experts in charge of the tools are implicitly obeyed, and it is in the expectation of such obedience that operators undertake to use such tools in the presence of the inexpert.

With regard to the comment that a radiology department ought to be in the charge of a medically qualified radiologist, I agree of course; and this is the state of affairs at the Wimbledon Hospital where I am in charge of the department. It is not suggested, I presume, that all the radiography is to be done in the presence of the radiologist, since this would be impossible under present circumstances, and it is for this reason that we train radiographers to do the actual radiography by themselves.

I am, Sir, yours faithfully,

F. T. BURKITT, M.D., D.M.R.E.

Wimbledon Common, S.W., Sept. 18th, 1933.

DENTAL SURGEONS IN THE MEDICAL DIRECTORY

To the Editor of THE LANCET

SIR,—I welcome Dr. Fawcett's letter suggesting the restoration of the names of dental surgeons to the Medical Directory. I have no doubt this might be arranged without greatly enlarging the size of the volume, and I feel sure it would lead to increased circulation. As an old teacher I am frequently approached by medical men seeking particulars of dental surgeons practising in London and elsewhere, as they are unable to obtain the necessary information from the Medical Directory.

I am, Sir, yours faithfully,

MONTAGU F. HOPSON,
Consulting Dental Surgeon, Guy's Hospital.

Sept. 19th, 1933.

To the Editor of THE LANCET

SIR,—The courteous letter of Dr. J. Fawcett in your issue of Sept. 16th calls for a reply from us. It was in our Medical Directory of the year 1866 that we first included a list of dental surgeons. For 59 years we continued this practice, but in 1924 we omitted the list. During these years the dental section had increased from 4 pages to 130 pages.

The reasons for our decision to discontinue the inclusion of the dental section in our volume were mainly twofold. The chief one was the paucity of subscribers amongst members of the dental profession. While medical men are in continual correspondence with one another by letter and by telephone, we do not think that this applies to dental surgeons in anything like the same degree. Consequently our volume was not such a necessity to them. Another reason that actuated us was the ever-increasing bulk of our book. The cogency of this argument is naturally much greater now when it is realised that there are 8000 more medical men than there were in 1924, to say nothing of the increase in the number of dental surgeons.

In the year 1925 we decided to issue the Dental Surgeons' Directory. Our hope that it would prove successful was unfortunately not realised, and we decided to discontinue its publication. We should like to draw attention to the fact that the Medical Directory *does* include particulars of some hundreds of dental surgeons who hold medical, in addition to dental, qualifications.

We are, Sir, yours faithfully,

London, Sept. 18th, 1933. J. & A. CHURCHILL.

*** Would it not be possible to test the feeling of subscribers to the Medical Directory?—ED. L.

HEART HOSPITALS FOR CHILDREN

To the Editor of THE LANCET

SIR,—It is much to be hoped that the "lack of enthusiasm" perceived by your annotator (p. 661) in an American review of children's heart hospitals will not find an echo among those who have been working at this subject in this country. Whatever failure may be found in such a hospital system, it would be cynical to reject it unless an alternative method of control of the disease were simultaneously suggested. There has been much scepticism in the past on the value of sanatorium treatment of pulmonary tuberculosis; nevertheless sanatoria for this disease continue to hold the field and with considerable effect. A similar position is pretty certain to evolve, in spite of financial considerations, in respect of rheumatism of childhood, about which disease it may still be said: "If preventable, why not prevent it?"

I am, Sir, yours faithfully,

MARTIN RAVEN.

Broadstairs, Sept. 18th, 1933.

HYPERTENSIVE ENCEPHALOPATHY

To the Editor of THE LANCET

SIR,—I have read with great interest the paper by Dr. H. Evans in your issue of Sept. 9th (p. 583). May I suggest that the rise of venous pressure should be estimated. If the cause of the encephalopathy is a rise of venous pressure—such a rise is usually small enough to be measured in centimetres of water—a liberal venesection ought to be of immediate benefit. A rise of venous pressure would produce also a rise of blood pressure, working probably through the vasomotor centres in the brain. It would also cause in some cases a pronounced spasm of the arterioles, in others a dilatation of them. In the first case a venesection would be of benefit; in the second case definitely harmful, if performed suddenly and liberally. The complicated and intricate problems involved are sometimes clarified to a certain degree by measurement of the arterial pressure in the central artery of the retina.

I am, Sir, yours faithfully,

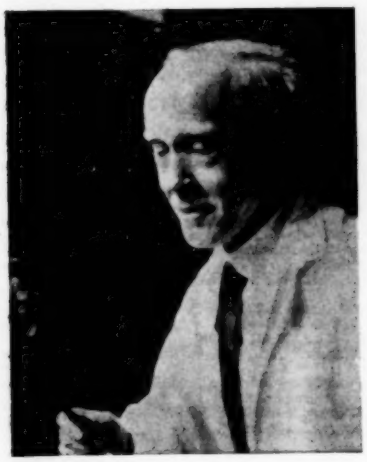
N. PINES.

London, Sept. 18th, 1933.

OBITUARY

FREDERICK GARDINER, M.D., F.R.C.S., F.R.S. Edin.

Dr. Gardiner, who died at his residence in Manorplace, Edinburgh, on Sept. 8th after a long illness, in his sixtieth year, was a well-known dermatologist. A native of Edinburgh, he graduated in medicine at the University in 1895, took the B.Sc. (Public Health) in 1901, and the M.D., with honours, in 1902. He was made a Fellow of the Royal College of Surgeons of Edinburgh in 1904. He had also studied mental diseases and for a time was assistant medical officer at Dundee Royal Asylum. Later he worked with Sir Robert Philip in the application of X rays to the diagnosis of tuberculosis. At this time he considered taking up a public health appointment, but, preferring to remain in Edinburgh, he turned to the study of skin diseases and, as was to be expected from a man of his working power and tenacity of purpose, he was soon recognised as a sound specialist.



DR. F. GARDINER

In due time he became senior physician to the skin department of Edinburgh Royal Infirmary and, shortly before his death, was appointed consultant. For a period he was a University lecturer on skin diseases and was consultant dermatologist at the Edinburgh War Hospital at Bangour. He was an attractive lecturer and many will remember his discourses on the management of the skin in infancy, given when the child welfare travelling exhibition visited Edinburgh. He contributed articles on diseases of the skin to Latham and English's "System of Treatment," and his own handbook ran through three editions.

By his friends Dr. Gardiner was esteemed as a man of great force of character, a hard worker, ready to turn to any problem with his whole power, lucid in exposition, and well up in several departments of medicine. He has left his mark in the skin department of service and will be missed by colleagues and patients. He leaves a widow and two sons, one of whom is a doctor in the city.

FELIX STEPHENS ROOD, M.B. Durh.

Mr. F. S. Rood, who died in London on Sept. 10th in his 51st year, was educated at University College School and Hospital, and took the conjoint qualification in 1906. Five years later, after further work in Newcastle-on-Tyne, he graduated in medicine at Durham University. After qualifying he was surgical casualty officer, later house surgeon and ophthalmic house surgeon to University College Hospital. Taking up throat and ear work as a specialty he became attached to the Paddington Green and later to the Lambeth and Norwood Children's Hospitals, but he gradually devoted himself more and more to the giving of anæsthetics, and at the time of his death he was senior anæsthetist to University College Hospital. Here he made a name for himself as a pioneer in the intravenous administration of ether, designing the apparatus which was chiefly used so long as that method was in vogue. He then became so expert in regional analgesia that surgeons willingly sought his assistance instead of keeping local anæsthetics in their own hands. He also made considerable use of spinal methods. In general anæsthesia his chief work was in helping to establish the popularity of open ether, working in association with Mr. Wilfred Trotter. Rood was naturally dexterous, and this led him to be asked by some surgeons to assist in a degree unusual for the anæsthetist. He thus made a practical success in two distinct branches of surgical work. In his early days he was an active member of the anæsthetic section of the Royal Society of Medicine.

MEDICAL NEWS

University of Birmingham

To mark the opening of the new session a reunion of past and present members of the medical school will be held on Tuesday, Oct. 3rd. The morning and afternoon will be devoted to a series of lectures for graduates and final year students, which will be delivered in the lecture theatre of the General Hospital. At 5 P.M. in the medical theatre of the University, Edmund-street, Dr. Arthur Hall, emeritus professor of medicine in the University of Sheffield, will distribute the prizes and deliver an address. At 7.45 P.M. there will be a reception by the Dean in the Great Hall, Edgbaston, and the old students' dinner will be held at 8.15 P.M.

Pharmaceutical Society of Great Britain

Prof. Henry E. Armstrong, F.R.S., will give the inaugural address at the opening of the 92nd session of the school on Wednesday, Oct. 4th, at 3 P.M.

Demonstrations of Contraceptive Technique

At 2.30 P.M. on Wednesday, Oct. 4th, demonstrations of contraceptive technique will be given at the Clinic for Constructive Birth Control and Racial Progress, 108, Whitfield-street, Tottenham Court-road, London, W. 1, to medical practitioners and senior medical students who will be given an opportunity of practising under tuition a variety of methods. A short lecture on methods will be given by Mrs. Marie Stopes, D.Sc., preceding the clinical demonstration by Dr. Evelyn Fisher. Application should be made to the hon. secretary of the C.B.C. at the address given.

Fellowship of Medicine and Post-Graduate Medical Association

A course in medicine and surgery will be given at the Metropolitan Hospital, Kingsland-road, on Oct. 2nd–14th, from 10.30 A.M. to 5.30 P.M. An afternoon course in dermatology will take place at the St. John's Hospital for Diseases of the Skin from Oct. 2nd–28th. An evening course on physical therapy will be held at the London Clinic and Institute of Physical Medicine from Oct. 2nd–25th. A special tutorial course in medicine, surgery, and midwifery for men graduates only has been arranged for the period Sept. 29th to Oct. 3rd, at the Connaught Hall of Residence (University of London), Torrington-square, W.C. A special intensive course in cardiology will take place at the National Hospital for Diseases of the Heart from Oct. 9th–31st. Further particulars of these courses may be had from the secretary of the Fellowship, 1, Wimpole-street, London, W. 1.

Mental Health Conference

The third biennial conference on mental health arranged by the National Council for Mental Hygiene will be held at the Caxton Hall, Westminster, London, S.W., from Nov. 22nd–24th, and will be opened by Prince George, president of the Council. The subjects which will be discussed include the place of mental health in the life of the nation; the working of the Mental Treatment Act, 1930; sex problems of adolescence; suicide and society; the neurotic; punishment or treatment; and the gambling spirit as a national problem. Among the medical men who have promised to take part in the proceedings are Sir Maurice Craig, Prof. W. Langdon Brown, Dr. J. S. I. Skottowe, Dr. J. I. Russell, Dr. E. B. Strauss, Dr. E. Graham Howe, Dr. Elizabeth Sloan Chesser, Dr. Doris Odlum, Dr. Bernard Hart, Dr. J. E. Nicole, Dr. T. A. Ross, Dr. J. R. Rees, Dr. R. G. Gordon, and Dr. H. Crichton-Miller. A special session for medical magistrates only will be held at the Royal Society of Medicine, 1, Wimpole-street, London, W., on Nov. 25th, when the medical attitude to crime will be discussed. Lord Horder will be in the chair, and the speakers will include Dr. M. Hamblin Smith and Dr. R. D. Gillespie. Application for tickets should be made to the secretary of the Council, 78, Chandos House, Palmer-street, London, S.W. 1.

Dr. R. E. Wodehouse has been appointed deputy minister of national health and pensions in the Canadian Government.

Appointments

BARKER, M., L.R.C.P. Lond., M.R.C.S., D.P.H., has been appointed Medical Officer of Health, East Ham.

DAVIES, EDITH M., M.B., B.Ch. Wales, D.P.H., Assistant Medical Officer of Health, Rhondda.

Certifying Surgeons under the Factory and Workshops Acts: BLUMFIELD, A., M.B., Ch.B. Liverp. (Barnoldswick, York); DAVISON, S. C. M., L.R.C.P. Lond., M.R.C.S. (Ashby-de-la-Zouch); VIGURS, C. C., M.D., B.C. Camb. (Newquay, No. 2 District, Cornwall).

Vacancies

For further information refer to the advertisement columns

Altrincham General Hospital.—Jun. H.S. At rate of £120.
Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
Birkenhead Infirmary.—Res. M.O. £300.
Birmingham, Canwell Hall Babies' Hospital.—Res. M.O. At rate of £250.
Burton-on-Trent General Hospital.—Cas. O. and H.P. £150.
Cancer Hospital, Fulham-road, S.W.—Asst. Radiologist. £350. Also H.S. At rate of £100.
Canterbury, Kent and Canterbury Hospital.—H.S. and H.P. Each at rate of £125.
Cardiff, Welsh National School of Medicine.—Jun. Asst. in Medical Unit. £250.
Chester Royal Infirmary.—H.S. £150.
City of London Hospital for Diseases of the Heart and Lungs, Victoria-park, E.—H.P. At rate of £100.
Edinburgh Royal Infirmary.—Clin. Tutor to the Dermatological Dept. £40.
Evelina Hospital for Sick Children, Southwark, S.E.—H.P. At rate of £120.
Grove Park Hospital, Lee, S.E.—Res. Asst. M.O. £350.
Guildford, Royal Surrey County Hospital.—Hon. Orthopædic Surgeon. Also H.S. £150.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—First and Second Asst. Res. M.O.'s. Each at rate of £150. Also H.P. and Jun. H.P. for Frimley Sanatorium. Each at rate of £50.
Hospital for Diseases of the Skin, 71, Blackfriars-road, S.E.—Registrar.
Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £100. Also Hon. Med. and Surg. Clin. Assts.
Huddersfield Royal Infirmary.—Jun. Cas. O. and Res. Anæsthetist. £150.
Isleworth, West Middlesex County Hospital.—Part-time Visiting Pathologist. 3 gns. per session.
Kidderminster and District General Hospital.—H.S. £150.
Leeds Maternity Hospital, Hyde-terrace.—Sen. and Jun. H.S.'s. At rate of £52 and £26 respectively.
Liverpool, Royal Southern Hospital.—M.O. to Spec. Depts. and Res. Anæsthetist. At rate of £60.
London Hospital, E.—Second Asst. and Registrar. £300.
London Jewish Hospital, Stepney Green, E.—Hon. Asst. Surgeon.
Manchester, Ancoats Hospital.—Res. M.O. and H.S. At rate of £150 and £100 respectively.
Manchester, Royal Children's Hospital, Pendlebury.—Res. M.O. and Res. Surg. O. Each at rate of £125.
Margate, Princess Mary's Hospital.—Res. Asst. M.O.'s. £350.
Middlesex County Council.—Two Res. Asst. M.O.'s. £400.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Hon. Asst. Gynæcologist.
Nelson Hospital, Merton, S.W.—Two Res. H.S.'s. Each at rate of £100.
Northern Hospital, Winchmore-hill, N.—Res. Asst. M.O. £350.
Nottingham General Dispensary.—Res. Surgeon. £250.
Oxford, The Warneford.—Jun. M.O. £300.
Parbold, Lancs, Wrightington Hospital.—Jun. Asst. M.O. At rate of £200.
Princess Elizabeth of York Hospital for Children, Shadwell, E.—H.P., Cas. O. Each at rate of £125.
Queen's Hospital for Children, Hackney-road, E.—Asst. Surgeon.
Radium Institute, Riding House-street, W.—H.S. At rate of £150.
Rowley Regis U.D.C.—Aural Specialist. 2½ guineas per session.
Royal Free Hospital, Gray's Inn-road, W.C.—Res. Cas. O. £150.
St. John's Hospital, Lewisham, S.E.—Res. M.O. £200.
Salisbury, General Infirmary.—H.S. At rate of £150.
Sheffield Royal Infirmary.—Clin. Asst. to the Dermatological Dept. £300.
Southern Rhodesia Medical Service.—Government M.O. £500.
Stafford, Staffordshire General Infirmary.—H.P. At rate of £150.
Stoke-on-Trent, North Staffs Royal Infirmary.—Asst. H.P. £125.
Taunton, Taunton and Somerset Hospital.—Sen. House M.O. At rate of £150.
Warwick, King Edward VII. Memorial Sanatorium, Hertford Hill.—Jun. Asst. M.O. At rate of £200.
Westminster Hospital, Broad-sanctuary, S.W.—H.S. to Ear, Nose and Throat and Eye Dept. At rate of £120.
Westminster Hospital Annexe, 66, Fitzjohn's-avenue, Hampstead, N.W.—Res. M.O. £200.
Wigan, Royal Albert Edward Infirmary.—Hon. Surgeon, Hon. Asst. Physician. Also Res. Med. and Surg. O. and Registrar. At rate of £250.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Coldstream, Berwick.

NOTES, COMMENTS, AND ABSTRACTS

EXERCISES DURING PREGNANCY AND THE PUERPERIUM

A group of students demonstrating exercises.

[*By courtesy of the "Nursing Times."*

THE need for a certain amount of regular physical exercise during pregnancy has long been recognised. In the past a woman was encouraged to continue her household duties almost to term, even when these involved heavy sweeping and scrubbing, though to what extent this was making a virtue of necessity it is difficult to judge. It is certain that many "household duties" are generally tiring without bringing into play the special voluntary muscles, the intelligent use of which, on the part of the mother, might possibly help her and her accoucheur at the crucial moment of delivery and later might expedite the restoration of normal tone. On the assumption that the exercises in which the abdominal and pelvic muscles are brought into play have a special value before, during, and after childbirth, Miss M. Randell, sister-in-charge of the School of Massage and Medical Gymnastics, St. Thomas's Hospital, and Miss Margaret Morris, of the Margaret Morris Movement School, have devised exercises which are especially adapted for the use of (1) the potential mother, (2) the expectant mother, (3) the puerperal mother, and (4) the post-puerperal mother.

Examples of these exercises, which were recently demonstrated at a meeting of the London Association of the Medical Women's Federation by massage students from St. Thomas's Hospital.

GROUP 1 (*for the potential mother*) includes exercises designed to teach correct posture with special attention to keeping the long axis of the body in a straight line.

The patient is asked to stand with feet slightly apart and placed parallel; instruction is then given in the correct poise of the body, which forms the foundation of all the exercises. The patient is taught how to control the various muscle groups. For example, she is asked to do a bilateral contraction of the glutei ("squeeze the cheeks of the buttocks towards each other"), and to note that this effort also approximates the thighs (adduction) and externally rotates and extends the knees. The body-weight is transferred to the outer side of each foot and the four outer toes, the feet are inverted and the ground is pushed away, as it were, by the soles of the feet. This is called "the strong position." The patient is instructed to think of her lower extremities as actively thrusting her trunk upwards, and is asked to note that there is an upward movement of the pelvic floor which occurs with the strong (simultaneous) action of the adductors. Her attention is then directed to her sphincters, and she is asked to tighten them and draw them upwards, and to note the simultaneous flattening of her abdominal wall that occurs with the gluteal contraction. This contraction can be still further increased by an attempt to make her abdomen recede. She is then asked to note that the hollow in her lumbar region is less, that her spine is straighter, that her lower ribs are wider, that her chest is higher, the back of her neck is well stretched, and her head level. A plumb line dropped from the lower part of the sternum will now fall in front of the pubis, whereas in an incorrect posture it rests on the abdomen.

Where there is a tendency to stiffness, exercises for flexibility of the spine are given.

The patient is asked to kneel, then sit back on her heels flexing her trunk forward until her head rests on her knees, her forearms on the ground. She is then asked to unfold, as it were, so that each part of the spine is gradually straightened from the sacrum upwards, leaving her head until last; the patient "breathes in" deeply in raising herself, and she is directed to keep her abdominal wall flat throughout; the forearms are drawn backwards until they rest on the knees. This is particularly useful in compressing the viscera and aiding the portal circulation.

GROUP 2 (*for the expectant mother*).—The muscles used in the standing exercises are used in other positions during pregnancy. The expectant mother is taught to contract groups of muscles while lying on an inclined plane, pelvis and legs being raised.

In sitting, bilateral contraction of the glutei, with simultaneous contraction of the abdominal wall and drawing upward of the pelvic floor, is held to be useful. If the arms are held at right angles to the trunk, with the hands at right angles to the arms, and the patient is asked to add a strong bilateral pushing movement to the above, the activity of the abdominal muscles is still stronger.

In the early months of pregnancy patients are trained in what is called a *delivery exercise*, devised by Miss Morris, care being taken to avoid strain.

Patient lies on the right side with right leg extended, left knee flexed and supported by both hands clasped under the knee. The patient holds this position and breathes in for six seconds. She then arches the back as strongly

as possible, and presses down her left knee against her hands, for six seconds, contracting all her muscles. She holds this "strong position" for a further period of six seconds, and then relaxes completely, allowing the left leg to rest on the bed, and rounding the back slightly. She does this for six seconds, breathing out and relaxing as much as possible. She then repeats the exercise from the beginning. When she has relaxed for the second time, she slowly assumes a position on her back with flexed and outwardly rotated thighs, flexed knees, and the soles of the feet together (if possible). The hands support the backs of the thighs just below the buttocks. Having taken six seconds to assume this position, she then arches the back as much as possible for six seconds, breathing in the whole time.

She then holds the arched position for a further six seconds, after which she relaxes, breathes out, and rolls over on to her side, resuming the position from which she started. The exercise can then be repeated on the other side and can with advantage be done to music.

GROUP 3 (*for the puerperal mother*).—During the puerperium the recumbent patient is taught to contract all her muscles, paying special attention to the adductors and pelvic floor muscles.

Lying with knees flexed and feet resting on the bed, the patient is asked to raise her pelvis off the bed until the hip-joint is fully extended; she then presses her knees and thighs together, draws her pelvic floor upwards, tightening her sphincter muscles. If she is asked to shrink away from an imaginary tight binder or belt, in front, laterally and posteriorly, she will more easily get an idea of strong muscular contraction.

This is said to be a useful exercise to correct visceroptosis, and when the patient understands it, can be practised in any position and localised to the abdomen, in order to gain control and muscle strength.

An exercise designed to *increase lactation* is that of stretching the arms obliquely upward and relaxing with crossing. This exercise, which can be done to music, has also been found useful in relieving tension in engorged breasts.

GROUP 4 (*for the post-puerperal mother*).—The patient kneels with hands on floor, she then arches her back in a cat-like movement, strongly contracting her abdominal muscles. From the same original position she is asked to sit back on her heels and is taught an undulating movement of her trunk. A similar movement is performed making the body pass through a circle laterally. The all-fours position is designed to correct any tendency to retroversion of the uterus, and the exercises to give localised work to the abdominal muscles and stimulate the blood-supply to the visceral organs.

Respiratory exercises are taught to all groups.

HEALTH IN SCHOOL-CHILDREN

THE TEACHER'S RÔLE

THE health of the modern school child is promoted in many ways, of which the most important are (1) the inculcation in his mind of health as an ideal, and (2) the periodical examination of his body structure and functions in order to ensure that abnormalities are detected and treated at an early stage. The first of these duties falls primarily on the teacher, the second on the school medical service, for the efficiency of which the coöperation of teachers with nurses and doctors is essential. The teacher is thus a vital part of the machinery of preventive medicine, whose equipment for his responsibilities depends on his capacity for absorbing principles which are not always easy to define, still less to apply. His task is complicated by the fact that our conception of hygiene is not static. If he is to help his pupils to acquire its elements he must keep himself up to date. Recognising his needs, the Board of Education has published a Handbook of Suggestions on Health Education[1] (incorporating two previous pamphlets in revised form), of which the main purpose is to encourage teachers to create in the minds of boys and girls during the years of adolescence an understanding and cultivation of health. Sir George Newman points out in an introduction that the handbook should not be regarded as a course or series of courses to be systematically worked through in class lessons, but as a compendium to be considered in planning progressive courses of training appropriate to the ages of the children. It is divided into two main sections, devoted respectively to the health of the individual and to that of the community. Of the seven chapters into which the first section is divided—body and mind; conditions of bodily health; the hygiene of food and drink; health education and the school curriculum; the practice of health habits; biology and health; and mothercraft and infant care—only one (the first) is unsatisfactory, gliding as it does in less than eight pages over human anatomy, physiology, pathology, and psychology. The following chapters are informative without being too dogmatic; for example, it is clearly stated (p. 32) that we have no means as yet of being able to prevent dental decay, however much care is taken, though the importance of such measures as are known to minimise the risk is insisted on. In this connexion it is regrettable that attention is not drawn to the desirability of renewing toothbrushes at least once a year, and of their occasional disinfection.

The chapter entitled The Hygiene of Food and Drink consists of 10 pages on food and 11 on alcohol. This curious allocation of space is evidently deliberate, since the section is headed by the following quotation from the report of the Royal Commission on Licensing:

"We accept the view that every child ought to receive specific and systematic instruction as to the properties of alcohol, as in all other matters which may affect future health, so that the child may at least be in possession of sound material on which to form a personal judgment when years of discretion are reached."

The section on food is relatively much more condensed but is well balanced, without the undue emphasis on vitamins at the expense of other necessary ingredients of diet which is common to many elementary text-books. The contrast between the simple expositions and the profound authoritative sources offered here and elsewhere as works of reference for more extensive study suggests a gap which surely does not exist in the literature of hygiene. It seems likely that a teacher who could read this handbook with profit would find "Food and the Principles of Dietetics," or No. 167 of the Special Report Series of the Medical Research Council beyond his powers of assimilation. It is regrettable that no references at all are given in the chapter on biology and health, where a background of knowledge is essential if the teaching is to be vivid.

The second and much shorter part of the book, dealing with health and the community, consists of a historical review of preventive medicine, the conditions of a healthy environment, and an excellent account of infective disease. It is certain that teachers will find in this handbook the answer to many of the questions they are asked, and to some which they ask themselves.

Evaluation of Equipment

To ascertain the extent to which individual teachers make use of such handbooks, and indeed to what degree they are really equipped to play their part as adjuncts in the school medical service, as well as in the teaching of the principles of hygiene to the children, is not easy.

The interpretation of statistics obtained by the

[1] Handbook of Suggestions on Health Education for the consideration of teachers and others concerned in the health and education of school-children. 1933. H.M. Stationery Office. Pp. 111. 6*d*.

officers of the school medical service in any area is always uncertain. For example, a high percentage of defects found may suggest bad local conditions or exceptionally thorough ascertainment; similarly a low prevalence of skin affections and of uncleanliness may indicate real progress or somewhat casual examination. An attempt has recently been made in America to make a statistical comparison of efficiency based not on results but on the methods employed.[1] A series of tests were made, some of which are analogous to the American Army intelligence tests, to test the knowledge and activities of the teachers and nurses, and of the extent of their coöperation with each other and with co-workers such as the doctor, the dentist, and the "oral hygienist"—an officer whose duties are to clean the children's teeth, examine them, and record the lesions or abnormalities needing attention. The fundamental elements in the school health programme are grouped under the headings: adequate examination; persistent follow-up; teachers' participation and responsibility in all aspects of the programme [sic]; live records; rapport among staff members. At first glance this list seems to omit the vital factor of the degree to which the coöperation of the parents has been enlisted; possibly this is covered by persistent follow-up, which would hardly be tolerated by unsympathetic parents.

The tests applied to *teachers* seem a little elementary.

For example, they are asked to state which are true and which are false of a number of dicta such as: (1) "Cotton" goods are better as conductors of heat than "woollen" goods. (2) Biting the finger nails is merely a wilful bad habit and does not have any connexion with the child's state of health. There are also "matching" tests in which the teacher has to put opposite a problem its correct complement of action. The problems may be (1) a child who always breathes through his mouth, and (2) a child who fails to respond promptly. The complements, one of which has to be "matched" to each of these situations are: (*a*) send the child home; (*b*) get the school physician to examine child; (*c*) child's hearing should be tested. With these and similar tests of knowledge there are practical tests on the teacher's capacity for recognising defects of hearing and vision and dental caries. Other estimates are made by means of a long questionnaire seeking for evidence of the teacher's activity in health matters and of her rapport with her colleagues.

THE NURSE AND THE DOCTOR

The tests applied to *nurses* are somewhat similar, and in addition they are submitted to tests indicating the degree to which they have been given instruction by the physician or dentist.

The adequacy of the examination by each *doctor* was assessed on: (1) individual hearing tests; (2) palpation of cervical glands; (3) accurate measurement of hearing distance; (4) posture inspection with lateral view of the child; (5) throat inspection with tongue depressor; (6) inspection of conjunctiva by inversion of lower lids; (7) clothing removed to waist; (8) inspection of spine with clothing opened.

The figures obtained using these indices of adequacy were poor, e.g., the throat was inspected as laid down in only 34 per cent. of the examinations, and the conjunctiva in only 27 per cent. It is suggested that more time is needed for each child, and might be obtained by adopting a system in which the school doctor would examine only those children referred to him by the teacher (and presumably by the nurse). The opinion that a school doctor should in some way be enabled to allot more time for difficult cases than he can at present is widely held in our own country; but few of us here would agree that "to pick individuals out from a group because they need attention is not an essential function of the school physician." The innovation desired by several medical officers in Great Britain would be rather that every child should be medically "inspected," and a minority reserved for a full and searching examination, the latter of course including children about whom the teachers had expressed anxiety.

We are not impressed with the scheme outlined above as a fair method of comparison between the efficiency of the school medical service in different areas. Its results might have dreadful iconoclastic effects on work which is probably on the whole adequate to its purpose, even if the ailing or defective child is picked out by clinical instinct rather than sifted by an elaborate network. In this country the provision of suitable literature and of opportunity for meetings between doctors, nurses, and teachers is gradually promoting close coöperation, and it seems unlikely that tests of efficiency would do much to hasten its advent.

[1] An Evaluation of School Health Procedures. By Raymond Franzen, Ph.D., Director of Research, American Child Health Association. New York: American Child Health Association. Pp. 127. 90 cents.

EVERYDAY SCIENCE AS A DEGREE SUBJECT

UNDER new regulations which come into force on the first day of Full Michaelmas Term, 1933, a knowledge of "everyday science" will be required for the ordinary B.A. degree at Cambridge University. For Part I. of the general examination candidates must take four of six papers, three of which are compulsory; and for the first time one of these deals with everyday science. The schedule of this subject was published in the *Reporter*, 1932–33, p. 1192, and runs as follows:

Gravitation; work; energy; power; machines. Solids, liquids, and gases: molecular theory of matter. Properties of solids: crystalline structure, elasticity. Properties of liquids, hydraulic contrivances, surface tension, solution, crystallisation. Properties of gases, diffusion: pumps. The atmosphere: atmospheric pressure and winds: weather-maps: composition of the atmosphere; combustion and oxidation. Mixtures and compounds: atoms and molecules chemical equations. Heat and temperature: transfer of heat: transformation of heat: engines and fuels. Waves, their propagation and properties. Propagation and characteristics of sound: hearing: recording and reproduction of sound. Common optical instruments: artificial lighting: colour: spectroscopy, invisible radiations. Heating and magnetic effects of electric current: motor, dynamo, and transformer: transmission of power: electrolysis: acids, alkalis, salts: conduction of electricity through gases: the valve: X rays. Structure of the atom: periodic law: radioactivity. Common chemical elements and their principal compounds.

Characteristics of living organisms. The cell. The elements of mammalian anatomy and physiology illustrated from man. A flowering plant as an illustration of elementary plant anatomy and physiology. Bacteria. Relationships of bacteria, green plants, and animals. Reproduction in plants and animals. Development. The elements of Mendelian inheritance. Evolution. Adaptation. Economic importance of Biology.

The constituents of human diet: the nature and value of the principal foodstuffs: the vitamins: food transport and preservation: water-supply. Parasites and saprophytes: bacteria. The causes of infectious diseases: the history and nature of epidemics: the prevention of infection. The history of inoculation, vaccination, and serum treatment. Occupational diseases. The duty of the individual and of the State in the prevention and control of disease.

It should be noted that general science has not been made a subject for Part I. of the natural sciences tripos.

NEW PREPARATIONS

PANDIGAL.—Messrs. Beiersdorf, Ltd., manufacturing chemists, of Welwyn Garden City, Herts, have sent us specimens of Pandigal, a preparation of *Digitalis lanata* Ehrhardt, the active principle of which is the glucoside Lanadigin. Among the advantages claimed for Pandigal over preparations

made from *D. purpurea* are more rapid digitalisation, accurate dosage, absence of toxic symptoms, and a constant and uniform pharmacological action, while its potency is stated to be indefinitely maintained. The preparation is put up in liquid form in drop bottles, which contain 7·5 and 15 c.cm. respectively, and in bottles of 100 c.cm. for dispensing. Tablets each containing 0·4 mg. of lanadigin are sent out in packets of 12, 50, and 250; suppositories and ampoules are also supplied. The dose is 8, 15, or 25 drops (half to one and a half tablets) three times per day. Pandigal may also be given in conjunction with calcium products for injection. Evidence of its convenience and efficacy is given from a number of German hospitals and clinics.

PARAGON SURGICAL PLASTERS.—Messrs. T. J. Smith and Nephew, Ltd., of Hull, are now issuing their well-known zinc-oxide surgical plasters in snap cylinders—that is to say, the spool containing the plaster fits into a cylinder of tin, in which it is retained by a small projecting stud. Pressure with the fingers releases the spool or refixes it in its case after use. This makes a convenient and an effective protection for the plaster when not in use. The spools contain 2½, 5, and 10 yards of plaster, the width of which varies from ½ to 4 inches.

Medical Diary

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.

THURSDAY, Sept. 28th.—8 P.M., Prof. Dr. Hans Maier: Practical Experience of Sterilisation in Switzerland over the past 50 years. (The lecture will be given in English.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 25th, to SATURDAY, Sept. 30th.—HOSPITAL FOR CONSUMPTION, Brompton. Intensive Course in Diseases of the Chest. All day.—WESTMINSTER HOSPITAL, S.W. Post-graduate Course in Medicine and Surgery (for men graduates only). All day.—GORDON HOSPITAL, Vauxhall Bridge-road, S.W. Course in Proctology. All day.—CONNAUGHT HALL, Torrington-square, W.C. Tutorial Course in Medicine, Surgery, and Midwifery (for men graduates only). All day, beginning Friday.—PANEL OF TEACHERS. Individual clinics are available by special arrangement with the Fellowship of Medicine. Courses, &c., open only to Members of the Fellowship.

ST. MARY'S HOSPITAL POST-GRADUATE COURSE.

FRIDAY, Sept. 29th.—10.15 A.M., Mr. Duncan Fitzwilliams: Carcinoma of the Rectum. 11 A.M., Mr. Leslie Williams: Some Remarks on Pre- and Post-natal Care. 12 A.M., Mr. J. Bright Banister: Contraception. 2.15 P.M., Dr. Wilfred Harris: Neurological Emergencies. 3.15 P.M., Dr. T. C. Hunt: Types of Functional Indigestion and their Treatment.

SATURDAY.—10.15 A.M., Mr. Aleck Bourne: The Gynæcological Aspect of Certain Neuroses. 11 A.M., Dr. Reginald Miller: The Acidosis Pandemic in Children. 12 A.M., Sir William Willcox: Rheumatoid Arthritis and Allied Conditions. 2.15 P.M., Mr. T. G. Stevens: Irregular Hæmorrhage at the Menopause. 3.15 P.M., Dr. A. Hope Gosse: Lantern Demonstration of Recent Advances in the Diagnosis and Treatment of Diseases of the Chest.

SUNDAY, Oct. 1st.—10.15 A.M., Mr. V. Zachary Cope: Some Common Mistakes in Surgical Diagnosis. 11 A.M., Dr. C. M. Wilson: Errors in Diagnosis. 12 A.M., Mr. A. Dickson Wright: Arterial Diseases of the Extremities. (These lectures are open to all medical practitioners without fee.)

CHARING CROSS HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.

SATURDAY, Sept. 30th.—10 A.M., Mr. J. B. Banister: Prolapse. 11 A.M., Dr. J. E. M. Wigley: Eczema and/or Dermatitis. 12 A.M., Mr. L. R. Broster: Surgical Emergencies. 2 P.M., Dr. Gordon Holmes: Paraplegia. 3 P.M., Dr. E. C. Warner: Recent Advances in the Treatment of Medical Diseases. 4 P.M., Mr. A. C. MacLeod: Some Surgical Cases of Interest.

SUNDAY, Oct. 1st.—10 A.M., Mr. E. D. D. Davis: Pathology and Treatment of Suppuration of the Antrum. 11 A.M., Dr. K. Shirley Smith: Syphilis of the Heart. 12 A.M., Mr. Peter Daniel: Diagnosis and Treatment of Common Rectal Diseases. 2 P.M., Dr. R. A. Hickling: Demonstration of Cases. 3 P.M., Dr. N. C. Lake: Value of Pre-operative Investigations. 4 P.M., Mr. R. A. Fitzsimons: Treatment of Fractures. (This course is open only to graduates and students of the school.)

ST. THOMAS'S HOSPITAL POST-GRADUATE COURSE.

MONDAY, Sept. 25th.—10 A.M., Dr. Yellowlees: The Disposal of Cases of Early Mental Disease. 11.15 A.M., Mr. Mitchiner: Treatment of Burns and Sepsis. 2 P.M., Dr. Tidy: Medical Round. 4.30 P.M., Dr. Z. Mennell: Anæsthesia.

TUESDAY.—10 A.M., Dr. Herbert: Artificial Pneumothorax. 11.15 A.M., Prof. Dudgeon: Septicæmia. 2 P.M., Mr. Max Page: Surgical Round. 4.30 P.M., Dr. Russell: The Electrocardiogram as an Aid to Diagnosis.

WEDNESDAY.—10 A.M., Dr. Shires: The Uses of Radium and X Ray Treatment in General Practice. 11.15 A.M., Dr. Dowling: Skin Diseases. 2 P.M., Dr. Hedley: Adelaide Ward. 3.30 P.M., Dr. Jewesbury: Diseases of Children. 4.30 P.M., Dr. J. B. Mennell: Low Backache.

THURSDAY.—10 A.M., Prof. Cowell: Dietetics. 11.15 A.M., Dr. Wyatt: Antenatal Care and Examination and the Significance of Albumin in the Urine of Pregnant Women. 2 P.M., Dr. Cassidy: Medical Round. 4.30 P.M., Col. Harrison: Demonstration of V.D. Cases and their Treatment.

FRIDAY.—10 A.M., Dr. Gardiner Hill: Endocrine Problems in the Special Departments of Medicine. 11.15 A.M., Prof. De Wesselow: Acute and Chronic Nephritis. 2 P.M., Mr. Nitch: Surgical Round with special reference to Urological Cases. (This course is open only to graduates and students of the school.)

WESTMINSTER HOSPITAL POST-GRADUATE SCHOOL.

SATURDAY, Sept. 30th.—9.30 A.M., Dr. Adolphe Abrahams: Indigestion. 10.15 A.M., Dr. W. E. Lloyd: P.U.O. 11.30 A.M., Mr. Gilbert Chubb: Earache. 12.15 P.M., Mr. Arthur Griffith: Sore Eyes. 2 P.M., Mr. E. R. Brockman: Backache. 2.45 P.M., Mr. C. Price Thomas: Acute Abdominal Pain. 4 P.M., Dr. Hildred Carlill: Fatigue. 4.45 P.M., Dr. S. E. Dore: Itching.

SUNDAY, Oct. 1st.—9.30 A.M., Dr. Donald Paterson: Anorexia in Children. 10.15 A.M., Mr. Tudor Edwards: Frequency of Micturition. 11.30 A.M., Mr. Stanford Cade: Difficulty in Swallowing. 12.15 P.M., Dr. Arnold Stott: Cough. 2 P.M., Mr. Stanley Dodd: Menorrhagia. 2.45 P.M., Mr. E. Rock Carling: Common Fractures. (This course is open only to graduates and students of the school.)

PRINCESS ELIZABETH OF YORK HOSPITAL FOR CHILDREN, Shadwell, E.

FRIDAY, Sept. 29th.—8.45 P.M., Prof. D. F. Fraser-Harris: Science and Poetry.

MANCHESTER ROYAL INFIRMARY.

TUESDAY, Sept. 26th.—4.15 P.M., Dr. W. Brockbank: Treatment of Cough.

FRIDAY.—4.15 P.M., Mr. Harry Platt: Demonstration of Orthopædic Cases.

Births, Marriages, and Deaths

BIRTHS

ANDERTON.—On Sept. 18th, in London, the wife of Captain Geoffrey Anderton, R.A.M.C., of a daughter.

CAFFREY.—On Sept. 6th, at Upper Pembroke-street, Dublin, the wife of Dr. P. J. Caffrey, W.A.M.S., of a daughter.

MACKENZIE.—On Sept. 15th, at Royal Naval College, Dartmouth, the wife of Surgeon-Commander K. A. Ingleby Mackenzie, R.N., of a son.

MCEWAN.—At Fernbrae, Dundee, on Sept. 13th, to Dr. and Mrs. T. Lawson McEwan, of 1, West-avenue, Exeter, Devon—a daughter.

MARRIAGES

BROAD—WEBB.—On Sept. 16th, at All Souls, Langham-place, James Vickers Broad, M.A., M.B. Camb., to Eileen Webb, M.B., B.S. Lond.

DRUCE—LAWRENCE.—On Sept. 16th, at the Parish Church, Croydon, Geoffrey Robert Goring Druce, L.D.S. R.C.S. Eng., to Margaret Joyce, elder daughter of Mr. and Mrs. D. A. Lawrence, of Addiscombe.

PERKINS—FALCONER.—On Sept. 9th, at St. Andrew's Presbyterian Church, Cheam, Surrey, Flight-Lieutenant Philip Harry Perkins, Royal Air Force, M.R.C.S., L.R.C.P., to Margaret Ogilvie, only daughter of the late Dr. Frank Falconer and of Mrs. Falconer, London.

THOMPSON—NUTHALL.—On Sept. 16th, at Esher, Keith Stewart Thompson, M.R.C.S., L.R.C.P. Lond., to Kathleen Ormsby, elder daughter of the late Mr. P. Nuthall and Mrs. Nuthall, of "Little Spinney," Esher.

DEATHS

BOWER.—On Sept. 16th, at Elton House, Gloucester, Ernest Dykes Bower, M.D., F.R.C.S. Edin., aged 79 years.

BOYD.—On Sept. 12th, at Carrick-road, Ayr, James Paton Boyd, M.B., C.M., late of Glasgow.

COATES.—On Sept. 15th, at Pentland-terrace, Edinburgh, Charles Middleton Coates, L.R.C.P., L.R.C.S.

GLYNN.—On Sept. 18th, at Leeds General Infirmary, Philip Edward Glynn, F.R.C.S. Eng., resident orthopædic officer.

HELME.—On Sept. 12th, at Oakroyd, Silverdale, Carnforth (formerly of Rusholme, near Manchester), James Milner Helme, M.D., in his 81st year.

HUGHES.—On Sept. 18th, at Eastbridge, Croydon, Morgan Hughes, M.R.C.S., L.D.S. Eng., aged 73 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.